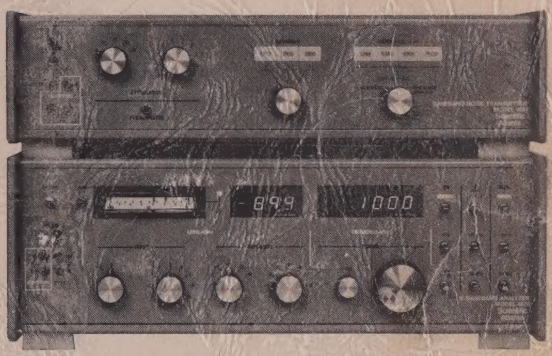
Instruction Manual

# Model 4680
# Radio Performance Analyzer



IMPORTANT NOTICE FOLLOWS
TITLE PAGE INSIDE

MP MASTER
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MODEL NO. _____

SERIAL NO. 157

CONTROLLED
DOCUMENT

# MODEL 4680
# RADIO PERFORMANCE ANALYZER

*In all correspondence concerning this publication, refer to* 351021Z

FIRST EDITION
AUGUST, 1976

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# instruction manual update

## SCHEMATIC ERROR - FIGURE 7-1

There is an error on Figure 7-1, page 7-3/7-4. The connector designators on A2A12, Pre-emphasis Network are incorrectly labeled. J1 and J3 should be interchanged. Therefore, W14 should be connected to J1 and W15 connected to J3.

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# CHAPTER 1
# GENERAL INFORMATION

## 1.1 GENERAL

This instruction manual contains information for installing and operating the Scientific-Atlanta Series 4680 Radio Performance Analyzer. Theory of operation, maintenance procedures, replacement parts lists, and schematic diagrams are also contained in this manual.

The 4680 Radio Performance Analyzer measures microwave radio performance. The Model 4680 is an ideal test instrument for conducting demand maintenance programs for microwave relay links. Demand maintenance imploys scheduled, periodic testing which enables the operator to recognize gradual degradation of the transmission parameters before they adversely effect the system.

## 1.2 PURPOSE OF EQUIPMENT

NPR, baseband response and tone search tests can detect gradual failure in a switching section. Selected IF testing allows the operator to monitor the carrier frequency and measure the carrier to interference (C/I), cross-polarization discrimination (XPD), and test side-to-side coupling.

The results of each test are monitored on the analog and digital meters, and are permanently recorded on the X-Y Recorder.

## 1.3 GENERAL DESCRIPTION

Three units make up the 4680 Radio Performance Analyzer. The Series 4660 Baseband Noise Transmitter is used in noise load testing and baseband response measurements. These basic performance measurements identify system noise due to echo distortion, intermodulation, and thermal noise.

### 1.3.1 MODEL 4660 BASEBAND NOISE TRANSMITTER

The Series 4660 contains a high pass filter, four low pass filters, and four band stop filters. It utilizes a standard pre-emphasis network equivalent to WECo 4208A. Systems of 1200, 1500, and 1800 channels can be tested without exchanging filters. The Series 4660 Baseband Noise Transmitter provides a noise power output from 0 dBm to -49 dBm in 1 dB steps. One control switch determines the mode of baseband testing. Automatic level control (ALC) circuitry maintains output level reference to 0 dBm.

### 1.3.2 SERIES 4670 IF/BASEBAND ANALYZER

The Series 4670 IF/Baseband Analyzer functions as a spectrum analyzer, selective level meter, and white noise receiver. Baseband input power levels between +10 dBm and -120 dBm are accurately measured in the frequency range of 10 kHz to 12 MHz. IF power levels between +10 dBm and -105 dBm are accurately measured in the frequency range of 35 MHz to 105 MHz.

Digital displays provide frequency indication and actual input power levels. Front panel control provide complete internal setup of all parameters so that no manual adjustments are needed when changing test modes. The Series 4670 has a standard de-emphasis network equivalent to WECo 4208B.

Input and reference attenuators provide the

proper input attenuation to the IF/Baseband Analyzer. Input covers a 30 dB range in 1 dB increments. Reference provides a 50 dB in 1 dB increments.

### 1.3.3 MODEL 4673 X-Y RECORDER

The Scientific-Atlanta Model 4673 X-Y Recorder is directly driven by the IF/Baseband Analyzer. The recorder features lightweight, rugged construction, and fiber tip pens. Baseband and IF amplitude vs. frequency plots are produced on 8½x11 inch graph paper.

## Series 4660 specifications

**Output Power**
*Is 0 ±0.25 dBm*

**White Noise Peak Value**
*12 dB above Rms*

**Output Flatness**
*Between 316 kHz and 10 MHz (measuring in a 1.74 kHz bandwidth). No point is greater than 0.5 dB below the highest point with bandstop filters out.*

**Total Output Power**
*Is held to within 0.1 dB regardless of whether the bandstop filters are in or out.*

**Output Attenuation**
*0 - 49 dB in one dB step.*

**Noise Output when Terminated**
*>60 dB below noise output when on.*

## Series 4670 specifications

**Frequency Range**
*Baseband, 10 kHz - 12 MHz*
*IF, 35 MHz - 105 MHz*

**Frequency Accuracy**
*±15 KHz in modes using wideband filter*
*± 1 KHz in modes using narrowband filter*

**Frequency Display Resolution**
*1 kHz*

**Maximum Signal Input Level**
*The input circuit of the unit protects itself against permanent damage when subjected to signal levels up to +16 dBm. The analyzer can accurately measure signal levels up to +10 dBm.*

**Maximum Sensitivity**
*Narrowband Filter 2.4 kHz — -120 dBm*
*Wideband Filter 30 kHz — -105 dBm*

**Amplitude Response Variation**
*60 kHz — 12 MHz ±0.2 dB*
*35 MHz — 105 MHz ±0.5 dB*

**Signal Amplitude Measurement Accuracy**
*0.5 dB maximum for a -20 dBm signal input at 1 MHz in the Baseband Mode and at 70 MHz in the IF mode.*

**Spurious Response**
*60 dB below the level of the input signal.*

**Spurious Signals at the Input of the Unit**
*With all input attenuators set for minimum loss, the level of spurious signals at the input shall not be greater than -75 dBm.*

# CHAPTER 2
# INSTALLATION

## 2.1 GENERAL

This chapter describes the basic installation requirements for the 4680 Radio Performance Analyzer. Also included are instructions if damage occurs during initial shipment from the factory.

## 2.2 UNPACKING AND INSPECTION

The 4680 and accessories supplied may be shipped in the optional carrying cases within conventional shipping containers, or within the conventional shipping containers if no carrying cases are supplied. In either case, carefully unpack the shipping carton upon original receipt of the equipment, inspecting all items for shipping damage. If damage is evident, contact the carrier and the nearest Scientific-Atlanta office immediately. The shipping carton may be used for storage or further shipment of the instrument. Save all packing material until satisfactory operation of the Model 4680 and all accessories is obtained.

## 2.3 ACCESSORY EQUIPMENT

### 2.3.1 SOFT COVER CARRYING CASES

Soft cover carrying cases provide protection for the test equipment. The carrying case includes extra space for power cables, control cables, and other associated accessories. A front panel protective shield is also provided with a soft cover carrying case.

### 2.3.2 HARD COVER CARRYING CASES

Hard cover shipping cases provide the extra protection during air or surface transportation. It contains a lightweight fiberglass shield which encloses a foam lining for shock protection.

### 2.3.3 CART

An easily maneuverable cart is recommended for use with the 4680 Radio Performance Analyzer. The cart design enables easy access to all of the instruments with an extra drawer for cables and accessories. Power receptacles are provided in the cart for convenience. A pull-up writing surface is also provided in the cart.

POWER
ATTENUATION
UNCALIBRATED
CHANNELS
RASCHRAND
POWER
ZERO SET
-899
1000
INPUT
REFERENCE
TUNING
MODE

# CHAPTER 3
# OPERATION

## 3.1 GENERAL

This chapter contains the information necessary to properly operate the Scientific-Atlanta Model 4680 Radio Performance Analyzer. Discussion of the front panel controls, indicators, and operating procedures are included.

## 3.2 CONTROLS AND INDICATORS

### 3.2.1 MODEL 4660 BASEBAND NOISE TRANSMITTER

**Attenuation.** Adjusts noise power output in 1 or 10 dB steps from 0 dBm to -49 dBm. Noise power output is 0 dBm when attenuation switches are in 0 dB position.

**Channel Identifiers.** Indicate channel capacity as determined by the band limiting filters installed in the unit.

**Notch Freq kHz.** Plastic indicators which identify the frequency of the slot filters in the unit.

**Baseband Control Switch.** Selects the proper mode of baseband operation. BB response position provides flat noise to 9500 kHz.

**Channel Selection Switch.** Selects one of three low-pass filters to test a specific circuit loading.

**Uncalibrated.** Illuminates if output noise power monitored at the Attenuation switches is not the proper level.

**124 Ohm Output.** 125 Ohm balanced output.

**XMTR Out.** 75 Ohm unbalanced output.

### 3.2.2 MODEL 4670 IF/BB ANALYZER

**Zero Ref.** Controls digital display level meter (3). In the normal switch position, the digital readout presents the input power level. When momentarily depressed, the digital display indicates the sum of the Input and Ref attenuators.

**Level - dBm.** Analog readout of input power level minus Input and Ref attenuator setting range of 10 dB (+3 to -7) for Baseband (BB) response measurement. Range of 70 dB (0 to 70) for NPR, tone search and IF measurements.

**Level - dBm.** 4 place digital display indicates the input power level when Zero Ref switch is not depressed. Indicates sum of Input and Ref attenuators when Zero Ref (1) switch is depressed.

**Frequency - kHz.** Digital display indicates frequency for both Baseband and IF modes.

**BB Response.** Momentary switch setting for BB response test. Sets analog meter scale to 10 dB range.

**NPR.** Momentary switch setting sets input filter to 1.74 kHz and analog meter scale to 70 dB range.

**Tone Search.** Momentary switch for fluctuation noise and spurious tone test. Sets input filter to 1.74 kHz and analog meter scale to 70 dB range.

**±5 MHz.** Momentary switch to provide IF Scan Range 65 to 75 MHz. Sets input filter to 30 kHz and analog meter scale to 70 dB range.

**±25 MHz.** Momentary switch to provide IF Scan Range 45 to 95 MHz. Sets input filter to 30 kHz and analog meter scale to 70 dB range.

**±35 MHz.** Momentary switch to provide IF Scan Range 35 to 105 MHz. Sets input filter to 30 kHz and analog meter scale to 70 dB.

**Record.** Pen down/pen up command to X-Y recorder as well as start signal for auto scan opertion.

**Auto.** Selects Automatic frequency scan.

**Manual.** Selects manual frequency tuning.
124 Ohm IN. 124 Ohm balanced input.
75 Ohm IN. 75 Ohm unbalanced input.

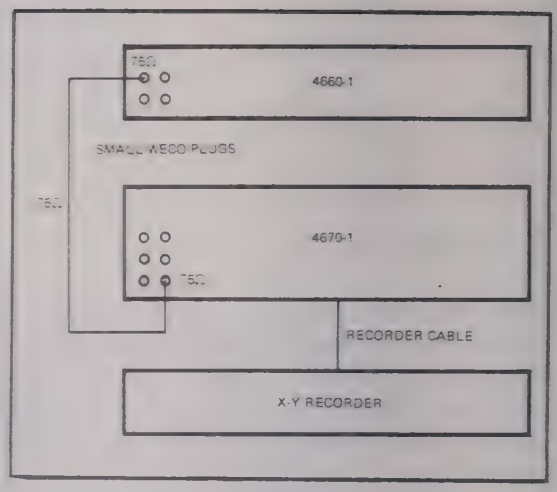
**Input Attenuators.** Providing +10 dB to −20 dB attenuation.

**Ref Attenuators.** Providing 0 to −50 dB attenuation.

**Tuning.** Fine and coarse tuning for frequency in the Manual Mode.

### 3.3 System Interconnection

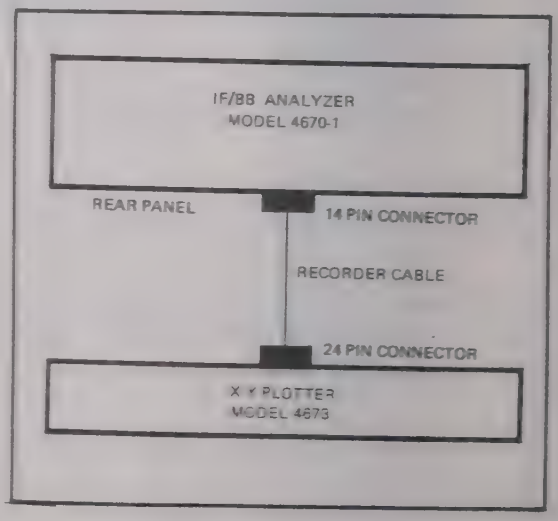
1. Connect the recorder cable between the Model 4670-1 rear connector to the X-Y Plotter rear connector.
2. Connect the yellow power cords to the Model 4670 IF/BB Analyzer and the Model 4660 Baseband Noise Transmitter rear power cord receptacle.
3. Connect both cables to power source.
4. Connect the power cord provided with the Model 4673 X-Y Recorder to the cord receptacle and power source.




### RECORDER CABLE

14 pin connector in Analyzer end, 24 pin concector in recorder end.

| Pins | Functions |
|---|---|
| 1 | Chassis GND |
| 2 | X-Axis Out |
| 3 | Not Used |
| 4 | Return (X-Axis) |
| 5 | Pen drop (Can vary 0 to 30V) |
| 6 | Return (Y-Axis) |
| 7 | Y-Axis Out (−) |



## 3.4 Operation

### 3.4.1 Initial Operation

Before operating the instruments, verify that the proper cable connections have been made.

1. Apply power to the IF/BB Analyzer.
2. Apply power to the Baseband Noise Transmitter.
3. Turn the recorder on.
4. Install paper. Place the chart paper on the recording platen and align the left edge and the bottom with the paper stop. Place Chart slide switch to Hold.
5. Set the Servo slide switch to On position.
6. Set the Pen slide switch to the Lift position.
7. Install Pen. The disposable pen is pushed into the notched holder located on carriage arm. Twist to lock in holder.

**CAUTION**

**THE DISPOSABLE PEN INCORPORATES A PRECISION WRITING TIP. CARE MUST BE TAKEN NOT TO DAMAGE THIS TIP DURING PEN CHANGING OR OTHER HANDLING. WRITING BY HAND ON ANY SURFACE MAY DAMAGE THE PEN TIP. USE THE PEN ONLY IN THE PEN HOLDER ON RECORDER.**

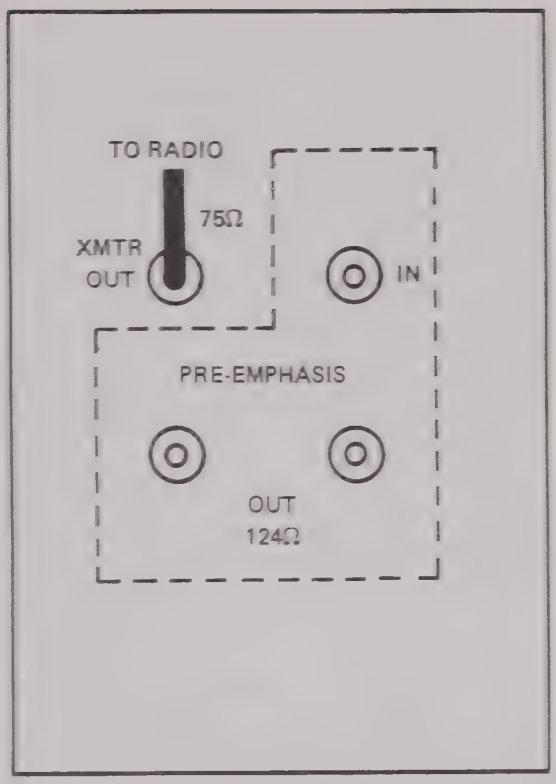
8. A Universal pen holder is provided in the accessory kit. It can be used with most filter-tip pens. Insert the pen into Universal holder and pull up locking ring.

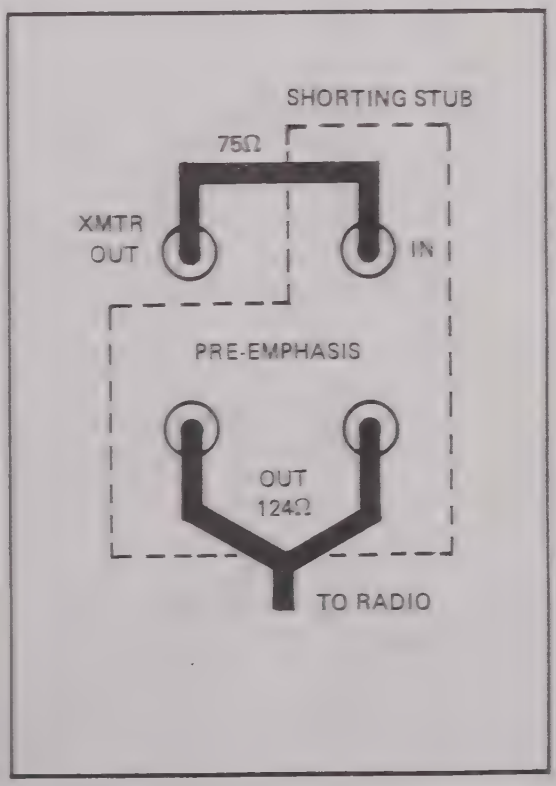
Refer to the Hewlett-Packard Instruction Manual for more detailed information.

## 3.5 Output Connectors

### 3.5.1 BB Noise Transmitter and Connectors

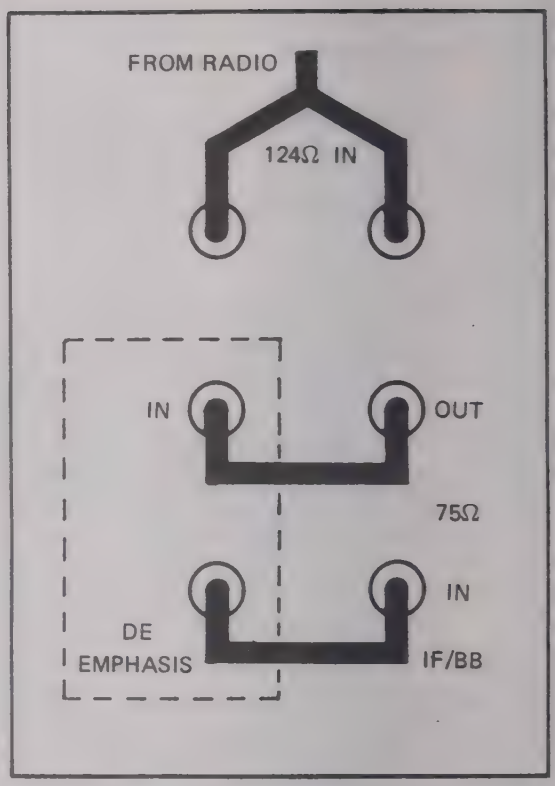
1. When a 75 ohm unbalanced output is needed, connect a cord with one WECo plug to the XMTR Out-75 ohm connector on the Model 4660.
2. When the internal Pre-Emphasis network is used, one shorting stub is needed between XMTR Out-75 ohm to In. Connect a double plug WECo cord between the 124-ohm Out WECo connectors on the Model 4660 and the radio input.

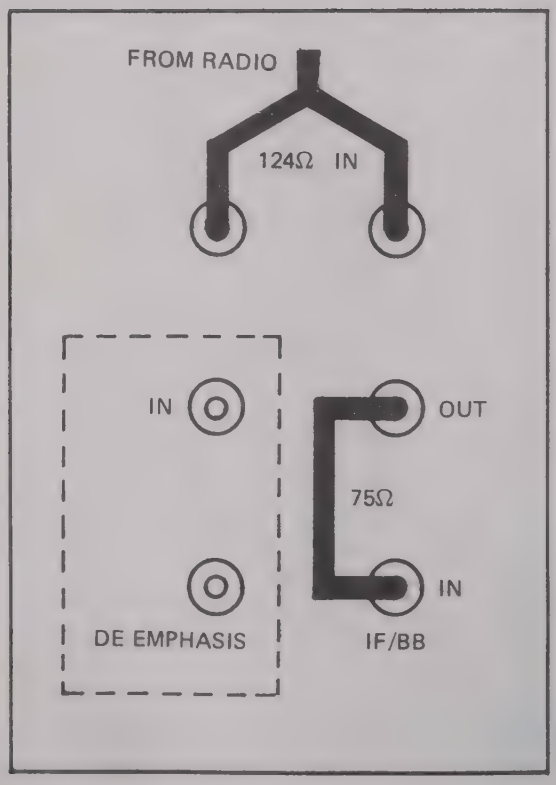


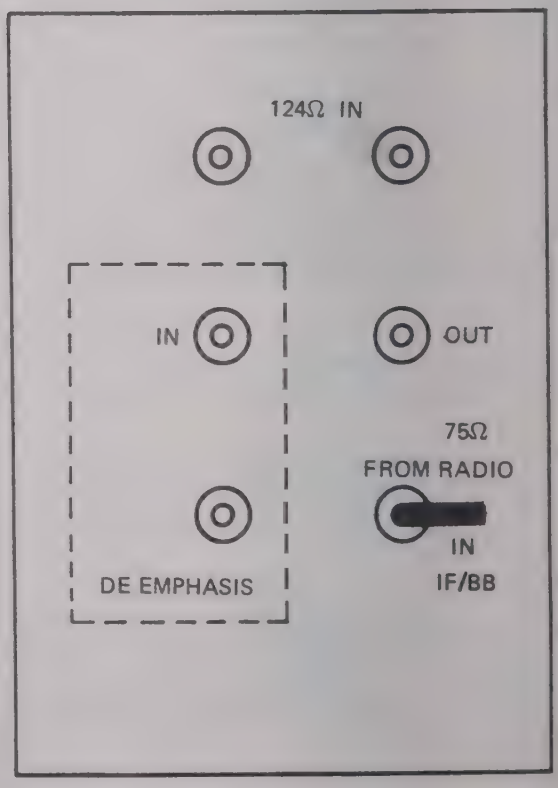



### 3.5.2 IF/BB Analyzer Connections

1. When the 124 ohm input is used, use the following procedure:
   a. When the internal De-Emphasis network is not in use, install one shorting stub between the 75 ohm Out and 75 ohm In WECo Connectors.
   b. Install two shorting stubs when the Model 4670 internal De-Emphasis network is used - one short between the 75 ohm Out and De-Emphasis In, the second shorting stub between De-Emphasis Out to 75 ohm In.
2. Connect a cord with one WECo connector to the Model 4670 75 ohm In when a 75 ohm unbalanced input is used.



## 3.6 Back-To-Back Baseband Self Test

The following back-to-back test procedures are provided to enable the operator to verify performance of the equipment.

Make the following connections:

### 3.6.1 Initial Set-Up

Set the baseband Noise Transmitter controls as follows:

| | |
|---|---|
| Attenuator | −20 dBm |
| Channel Selection | 1200 |
| Baseband Control | BB Response |

IF/BB Analyzer as follows:

| | |
|---|---|
| Input | −20 dBm |
| BB Response | Momentary Switch |
| Reference | Adjust for 0 dBm on level meter (2) |

Set the IF/BB Analyzer to Manual Mode and adjust the frequency Tuning knob to 1 MHz. Adjust the vertical control on the X-Y Recorder for 0 dBm on the BBR reference line and horizontal control on the recorder for 1 MHz.

Select Auto and wait for the pen to become stable at the left margin of the recorder.

Select Record.

Observe an automatic scan and a plot of the baseband amplitude response for 1200 channel loading. Verify performance by comparing to back-to-back standard chart in this section.

### 3.6.2 NPR

**1. Recorder Zero Adjustment**

NPR Slots In on the Model 4660.

Select NPR and the Manual on the Model 4670. Adjust the Reference to read 0 dBm on the level display. Set the frequency to 1 MHz. Set the Horizontal and Vertical controls on the recorder to the 1 MHz and 71 dBmCo point on the X-Y Plotter reference line. Select Auto and wait until the pen becomes stable. Select Record.

**2. NPR Plot**

Select Auto and Record to observe an NPR plot with the appropriate slots (1248,5340), Verify performance by comparing to the back-to-back NPR Chart.

### 3.6.3 TONE SEARCH

Select Tone Search on the Model 4660 and 4670.

Select Auto and wait until the pen becomes stable.

Select Record.

Observe a tone search plot. Verify proper levels by comparing to the standard back-to-back baseband plots in this section.

### 3.6.4 1500 CHANNEL BASEBAND TESTS

Repeat the previous tests with 1500 channel loading selected on the Model 4660. Verify results by comparison to the standard back-to-back X-Y plots for this channel loading.

### 3.6.5 1800 CHANNEL BASEBAND TESTS

Repeat the three tests with 1800 channel loading selected on the Model 4660. Verify the results by comparing them to the graphs in this section.

### 3.6.6 IF SELF TEST

1. Terminate the 75 ohm-In connector on the Model 4670.
2. Depress the ±35 MHz switch.
3. Set Input attenuation to −20 and Reference to −50.
4. Select Auto and wait until the pen is stable at the left margin of the recorder.
5. Select Record.
6. Verify that there is no internally generated noise above −105 dBm.

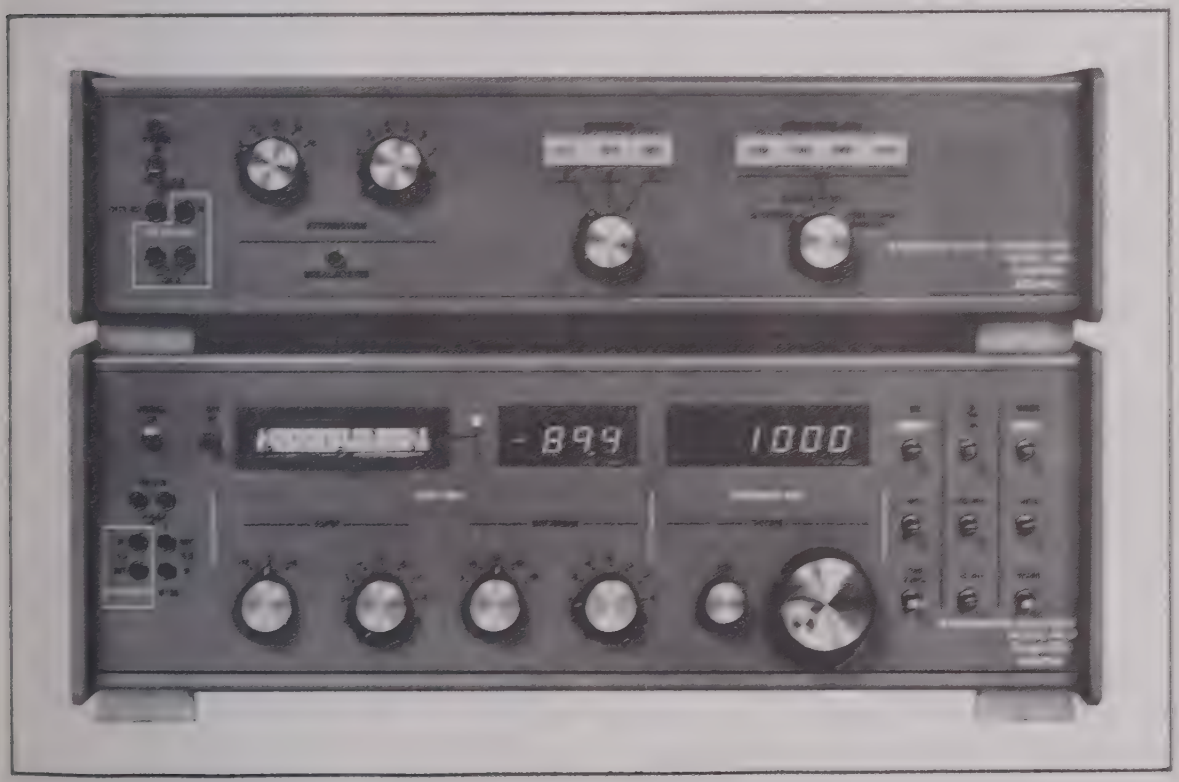
# CHAPTER 4
# THEORY OF OPERATION

## 4.1 INTRODUCTION

This chapter contains the theory of operation for the Model 4680 Radio Performance Analyzer. Discussions of the Model 4660 and 4670 are presented separately within this chapter. Refer to the recorder instruction manual for information on the recorder theory of operation.

## 4.2 GENERAL DISCUSSION

The theory of operation for each unit is broken down to a subassembly level and a general description of the signal flow is given. Block diagrams and timing diagrams are shown where applicable.



## 4.3 DETAILED DISCUSSION

### 4.3.1 MODEL 4660 BASEBAND NOISE TRANSMITTER

The noise source, filters, and ALC amplifier are mounted in separate modules in the Model 4660-1 Mainframe. The filters are interchangeable. Because of special components used in the filters, some of which are factory selected, and because of the tuning procedures required, the filters are not field repairable items. Normally, no mainframe is required. Therefore, detailed schematics and replacement parts information is given for the Model 4660-1 Mainframe, including the noise source and ALC amplifier, and a general description is given for the different types of filters.

The power supply consists of a dual primary transformer, bridge rectifier, and three-terminal regulator. The rectifier and three-terminal regulator are mounted on a PC card. The nominal output voltage is −24 volts dc. The three-terminal regulator is an integrated circuit with built-in thermal protection and fold-back short-circuit protection. The power supply operates from 115/230V ac, ±10%, 47-63 Hz.

The noise originates primarily as thermal noise from resistors at the input of a high-gain amplifier, although some transistor noise is also present. The noise is amplified by three transistor stages, each with feedback to provide gain stability. The first stage is made up of Q1, Q2, and associated components. The second stage contains Q3, Q4, and Q5, and the third stage contains Q6, Q7, and Q8.

The input to Q1 is terminated by R1, R3, and R4. It is the thermal noise from these resistors that is the main source of noise.

The first amplifier stage is a non-inventing feedback pair with gain determined primarily by the feedback network consisting of R7, R8, and R9. Capacitor C2 provides for a 2 dB peaking adjustment at approximately 24 MHz.

The second and third stages are similar. For the second stage, feedback is from the output of Q4, through the emitter follower Q5 to the base of Q4. The gain is determined primarily by the feedback network consisting of R21, R22, and R23. The output of the third stage is fed through R36 to the output connector J2. The output impedance is 75 ohms.

An input attenuator consisting of T-pads R16-R18 and R37-R39 provides a means of checking the gain and frequency response of the noise source amplifier. Normally, the input (J1) to this attenuator is left disconnected.

The noise power supplied to the output attenuators is held at a constant average level by the automatic level control (ALC) in the ALC Amplifier and Detector unit.

Noise from the band-limiting filters is fed to J1, the input of the ALC Amplifier and Detector. The noise is fed through a broadband varactor attenuator, amplified by two feedback stages, and delivered to either J2 or J3. If the notch filters are inserted, noise is fed from J2 through the notch filters back to J4, and then to J3 to the output attenuator. If the notch filters are bypassed, the noise output is fed through the T-pad consisting of R24, R25, and R26 to the output connector. Switching is accomplished by relays K1 and K2. Note the relay circuit that disconnects the output of the amplifier and provides a 75 ohm termination (R51) when the Baseband Control switch is in the Noise Off Position.

The input to J1 is amplified by emitter follower Q1 and fed to the varactor attenuator consisting of CR2 and CR3. The attenuation of this network is varied by changing the reverse bias on CR2 and CR3. The control voltage appears at the junction of R5 and CR1.

The output of the varactor attenuator is fed to the FET input of a transistor feedback pair consisting of Q2 and Q3. Gain is determined primarily by the feedback network consisting of R10, R11, and R13. The signal is further amplified by Q4, Q5, and Q6. For this stage, feedback is determined by R19, R20, and R21. The output impedance of the

emitter follower Q6 is quite low. R23 provides an output impedance of 75 ohms for the ALC amplifier.

The noise output is sampled by Q7 and fed to a temperature regulated matched detector consisting of U1. Excellent power stability with no warm-up time required is provided by this circuit. The signal is rectified by U1-A, and the differential output from U1 is amplified by U2B. R40 supplies an offset current and sets the output power level. The output of U2B controls the amplifier gain by controlling the varactor attenuator bias. The output of U2B is also fed to a circuit which serves if the control voltage is either too high or too low for proper operation of the ALC amplifier. Q9 is switched on by either CR4 or CR5 if the control voltage is out of limits. When Q9 is turned on, it turns Q8 on to turn on the front panel Uncalibrated light.

The ALC Amplifier and Detector will not work if the noise source is connected directly to the ALC amplifier without being connected through the band-limiting filters. The noise power will be too high for the limited range of the varactor attenuator.

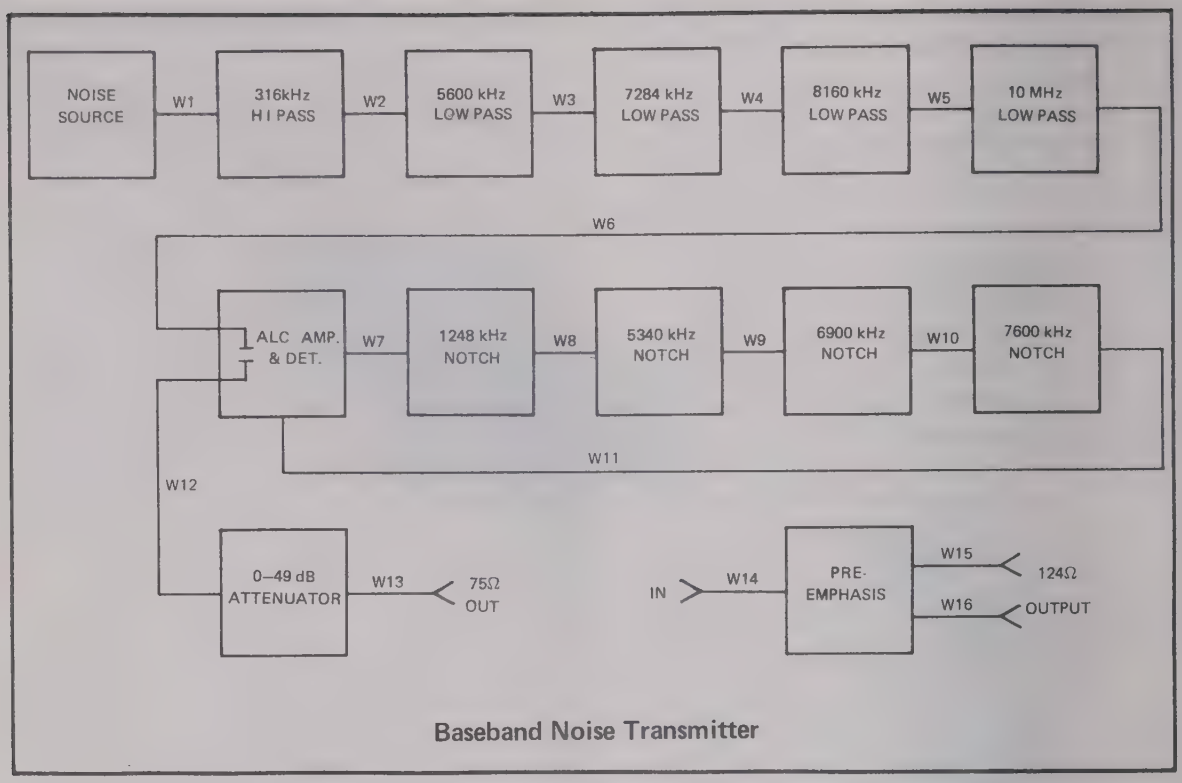
The high-pass filters are seventh-order Chebyshev designs. They are designed for 26 dB passband return loss, although coil losses and component value tolerances reduce this value to 20-30 dB. The minimum stopband attenuation is approximately 40 dB. Curves of the insertion loss for the 316 kHz high-pass filter are given

The low-pass filters are seventh-order Cauer-Chebyshev design. The bandwidth of the filters is adjusted to make the noise bandwidth equal to the nominal specified bandwidth. The 3 dB bandwidth for most of the low-pass filters is higher than the specified cut-off frequency. The design value for pass-band return loss is 26 dB for most of the filters, but the actual minimum return loss varies from 20-23 dB because of coil losses and component tolerances.

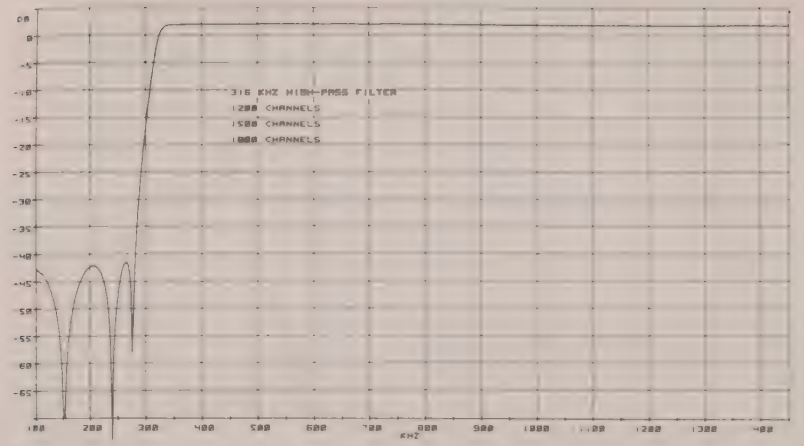
The low-pass filters have built-in attenuation to compensate for the higher noise power in the wider bandwidths. The loss of these filters is given below: The low-pass filters are switched in or out by internal relays. To bypass the filter, -24V dc is applied J3, pin B.

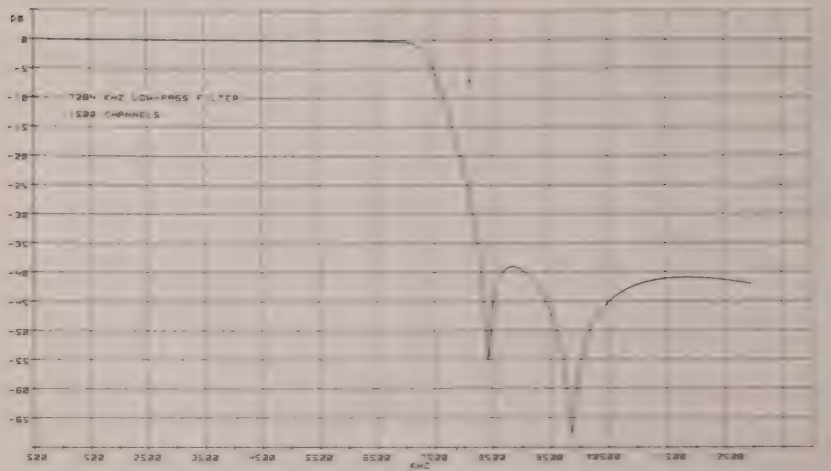
Plots of the insertion loss for the kHz low-pass filter are given

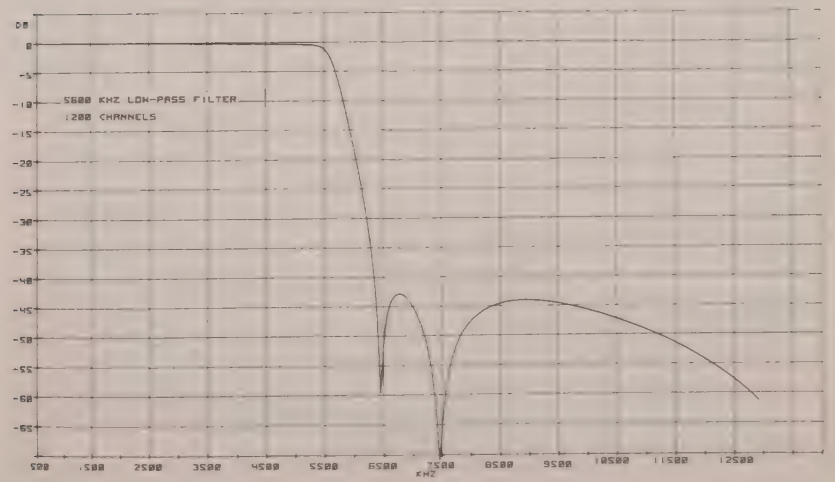
The design of the notch filters varies. Generally, they are transformations from fifth-order Chebyshev low-pass filters with pass-band ripple of .044 dB. Plots of the 1248 kHz notch filter are given

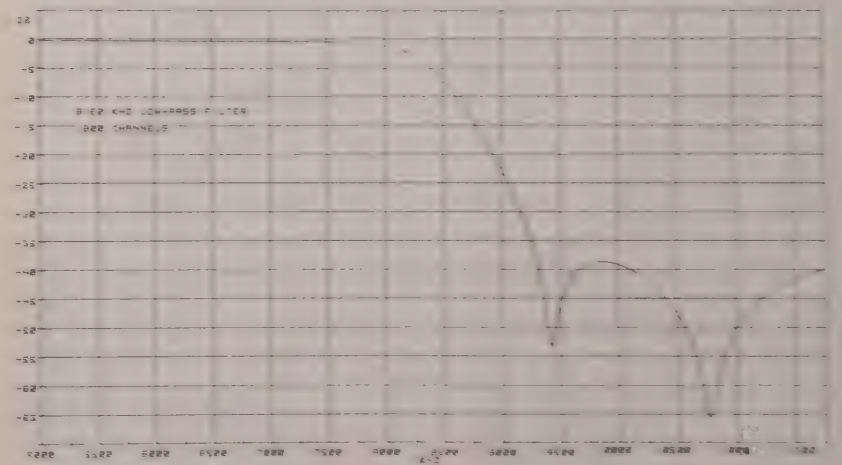


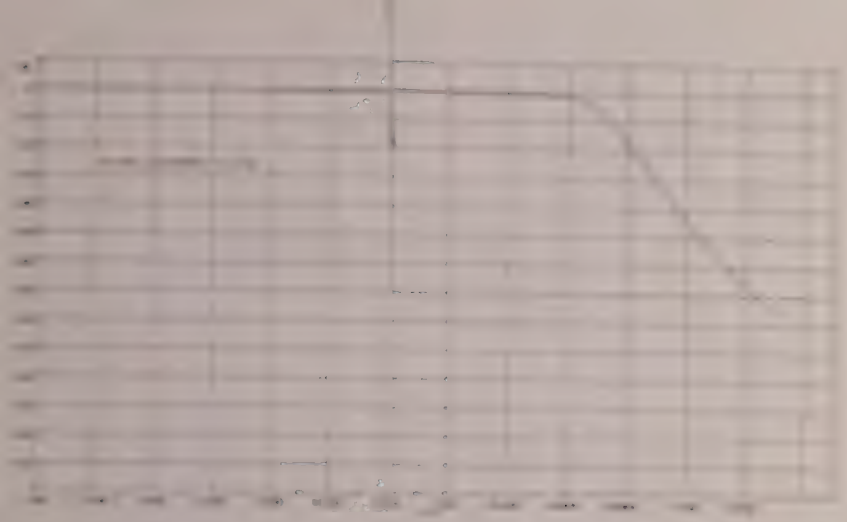

**Baseband Noise Transmitter**

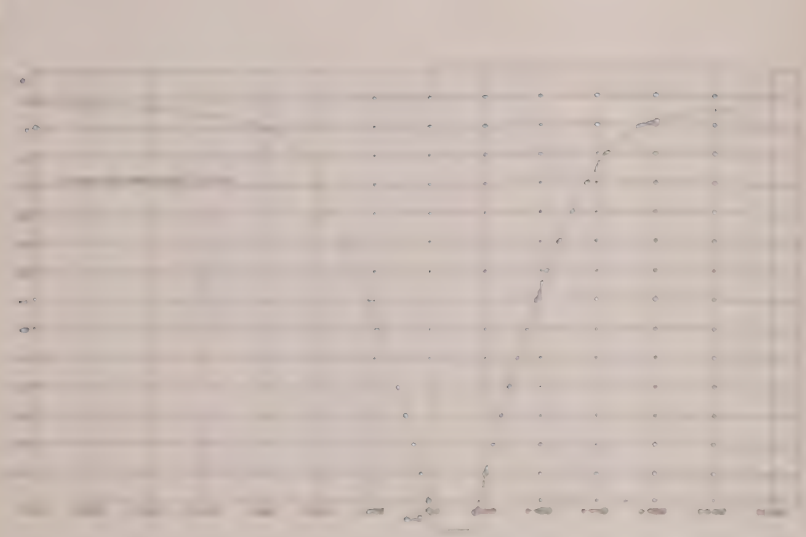

DB
316 KHZ HIGH-PASS FILTER
1200 CHANNELS
1500 CHANNELS
1800 CHANNELS
KHZ

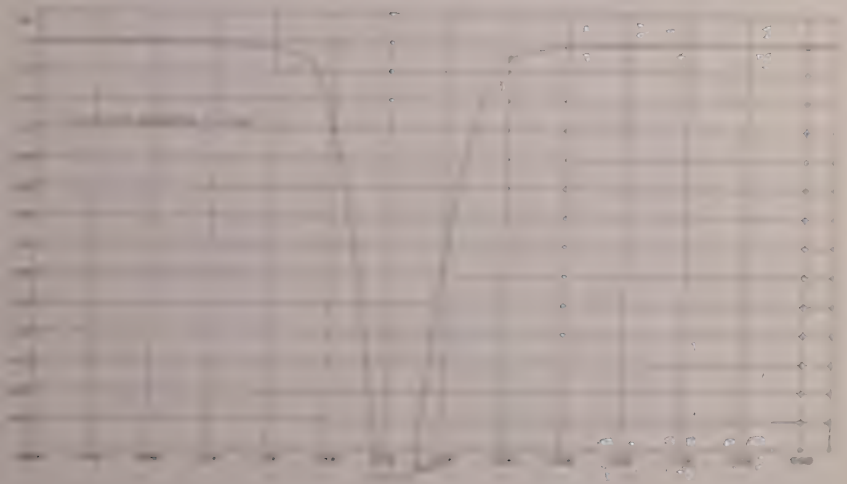

DB
KHZ

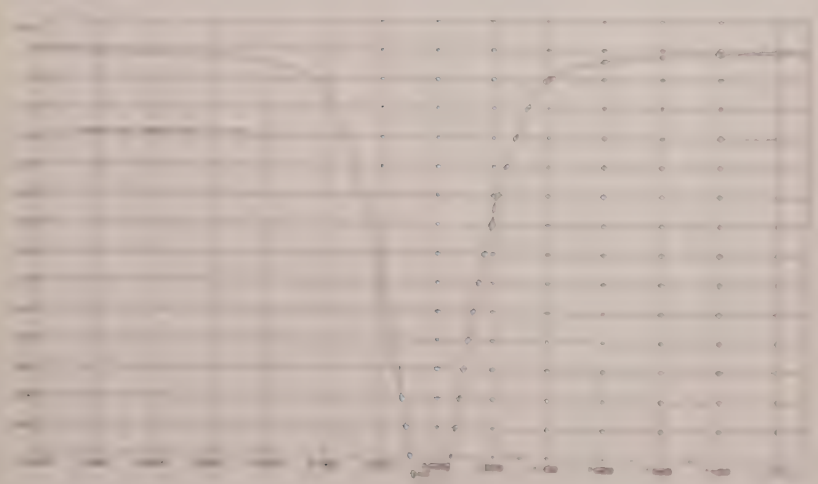

DB
5600 KHZ LOW-PASS FILTER
1200 CHANNELS
KHZ

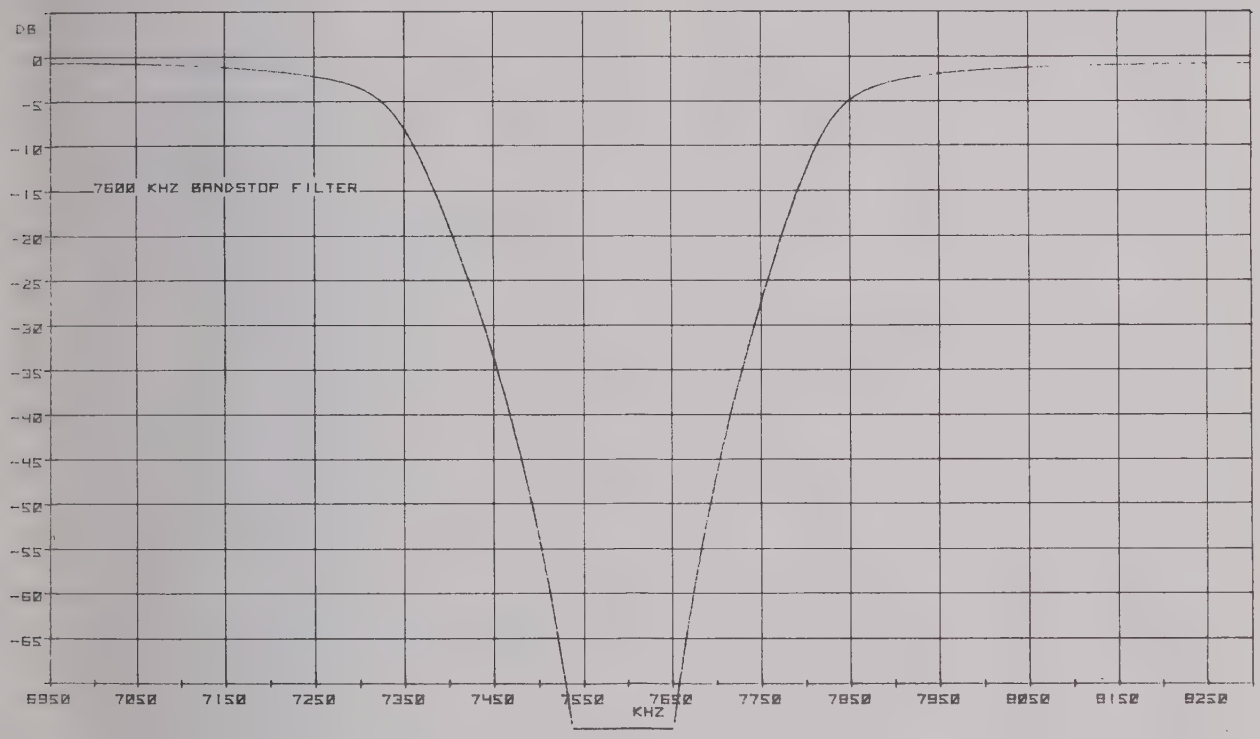











DB
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
7600 KHZ BANDSTOP FILTER
6950
7050
7150
7250
7350
7450
7550
7650
7750
7850
7950
8050
8150
8250
KHZ

### 4.3.2 IF/BASEBAND ANALYZER, MODEL 4670

The general block diagram of the Model 4670 IF/Baseband Analyzer is shown in Figure . The baseband input de-emphasis network, A10, has a 124Ω balanced input and a 75Ω unbalanced output. The de-emphasis network's response is Western Electric specification 4208B. Baseband as well as IF signals can be applied to the 75Ω unbalanced input which is connected directly to the 0 to 30 dB input attenuator. This attenuator is remotely operated by a binary code generated by the front panel mounted switches labeled "INPUT". Also within the attenuator is a SPDT relay which automatically switches the attenuator's output between the IF converter and the baseband converter depending on the test mode selected.

In the IF mode, the 40 to 105 MHz IF input signal passes through a 110 MHz low pass filter. At the filter input is an FET overload detector. From the filter the signal is amplified and mixed with the 185 to 255 MHz IF local oscillator, IF L.O., to yield a 150 MHz IF signal for a 70 MHz input signal. The 150 MHz signal then passes through a bandpass filter with a bandwidth of 5 MHz. This filter rejects the IF L.O. as well as the upper sideband of the mixer. The output of the filter is then mixed with a 120 MHz crystal controlled oscillator to yield a 30 MHz signal which is routed to the baseband converter.

In the baseband mode, the 10 kHz to 12.5 MHz BB input signal passes from the input attenuator to a 13 kHz low pass filter. At the filter's input is an overload detector. At this point the BB signal is mixed with the 30 to 42.5 MHz BB local oscillator, resulting in a 30 MHz IF frequency. This 30 MHz signal is then amplified and routed to a switch which selects either the 30 MHz signal from the baseband converter or the 30 MHz signal from the IF converter. From this point on both the BB and IF signals follow the same path through the analog and signal processing circuits. From the switch the signal passes through a 30 MHz crystal filter whose function is to reject the unwanted baseband L.O. signal which fed through the mixer. The 30 MHz filtered signal is further amplified and mixed with a 29.697 MHz crystal oscillator signal to yield a 302.727 kHz IF signal.

Up to this point the input signals have been upconverted and filtered to remove undesired L.O. signals and harmonics and then downconverted to 302.727...kHz. Now the signal passes through a 302.727...kHz bandpass filter with a bandwidth of 30 kHz. This particular filter determines the power measuring bandwidth in all of the IF test modes and in the Baseband Response test mode. The signal is then amplified to compensate for the filter's insertion loss and mixed with a 272.727...kHz L.O. The resulting 30 kHz signal is applied to a switchable filter stage. In the NPR and Tone Search test modes, the signal is routed through a 30 kHz bandpass filter. This filter in conjunction with the filter in the 30 kHz IF module provide an effective 1.74 kHz power bandwidth. For all other test modes the 30 kHz signal passes unfiltered directly to a buffer amplifier.

The 30 kHz IF module has a 0 to 50 dB gain amplifier whose gain is adjustable in 1 dB steps by the switches on the front panel labeled "REFERENCE". From the amplifier stages the signal either passes through the previously mentioned 30 kHz bandpass filter or a 100 kHz low pass filter whose function is to remove the unwanted component of the 272.727...kHz L.O. that fed through the mixer in the 302.7 kHz IF module.

The signal now proceeds to the signal processing and measurement portion of the instrument, the first stage being a 0 to 60 dB auto range amplifier. The output of this amplifier drives a true rms to dc converter. The output of the rms converter is sensed by comparators which adjust the gain of the auto range amplifier in 10 dB steps so that the rms converter operates over only a 10 dB range

instead of the entire 60 dB range. For the same reasons, the log amplifier which follows the rms converter has only to operate over a 10 dB range. By operating over a relatively small dynamic range, accuracy is increased. The output of the comparator and shift register is fed to a digital to analog converter whose output is summed with that of the log amplifier to yield a signal that is proportional to the logarithm of the true rms value of the signal appearing at the input to the auto range amplifier.

From the summing amplifier the signal passes to the meter and recorder interface board, A1A6. Here the signal is conditioned by varying the response time of the signal depending on the particular test mode selected so that the XY recorder can accurately plot the peak value of rapidly varying signals. From here, the signal goes through the Y-axis gain adjust potentiometer to J1 on the rear panel. This circuit also provides the signal to drive the front panel mounted analog meter.

The output of the log amplifier and the shift register are also routed to the A/D converter board, A1A1. This circuit which contains a microprocessor which combines the settings of the "INPUT" and the "REFERENCE" attenuators along with the shift register output and the log amplifier output to generate a digital signal which represents the absolute value of the input signal in dB. This digital signal then proceeds directly to the LED level display on the front panel.

The baseband local oscillator, BB L.O., is a stable LC oscillator that can operate in two modes: manually by means of the front panel controls and automatically by the sweep circuitry in the auto scan mode. The BB L.O. serves as the reference for all measurement frequency generation and reference for the front panel frequency display. One of its outputs goes directly to the baseband converter for upconverting the baseband spectrum to a 30 MHz IF signal. The other output is divided by a factor of 10 and used as a reference for the IF local oscillator.

The IF local oscillator, IF L.O., is a 185 to 255 MHz voltage-controlled oscillator. The VCO's output is divided by a factor of 60 and applied with the previously mentioned reference from the BB L.O. to a phase detector which generates a dc voltage which is proportional to the phase error between the two input signals. This error voltage is amplified and filtered by the APC amplifier which in turn is routed to VCO whose frequency is changed in the direction necessary to reduce the error voltage to zero. The fundamental output of the IF L.O. is applied to the IF converter for upconverting the 45 to 105 MHz IF input signal to a 150 MHz IF signal.

The scan control board, A1A5, has two main functions. The first function consists of generating various gating and local oscillator signals. A 6 MHz crystal oscillator serves as the master clock reference. Its output is divided by a factor of 12 to yield 500 kHz which is used by the digital counter for various gating and timing functions. The output is also divided by a factor of 22 to give 272.727. . .kHz which serves as the L.O. for converting the 302.727. . .kHz signal down to 30 kHz. The second function of this board is to generate a voltage proportional to the BB L.O. frequency and condition that voltage to properly drive the sweep generator and the Y-axis on the recorder. The BB L.O. signal divided by10 is mixed with 3 MHz (6 MHz master clock divided by 2). After passing through a 1.5 MHz low pass filter to reject the upper sideband, the signal goes to a frequency-to-voltage converter whose dc output is directly proportional to BB L.O.'s frequency. This dc signal is then fed to a summing amplifier whose offset and gain are determined by the test mode selected. In this manner, the outputs to the sweep generator and the recorder's X-axis are such that the recorder always starts at the proper point and sweeps the full length of the chart regardless of the test mode selected.

The function of the mode logic section of the sweep generator and mode logic board is to interpret the test mode switches' positions

and appropriately select the proper filter bandwidths, sweep and retrace times, scan frequencies and signal conditioning. Forward sweep time is nominally 45 seconds except for 70 ±35 MHz and Tone Search test modes. Forward sweep time for 70 ±35 MHz is 70 seconds; for Tone Search, 180 seconds. Retrace time for all baseband test modes is as rapid as the recorder can slew back to the starting point. Retrace time for IF test modes is intentionally slowed so that the phase lock loop of the IF L.O. will not lose lock during retrace.

The sweep generator section generates a ramp signal which is summed with the dc signal representing BB L.O. frequency from the scan control board. This composite sweep signal is fed to the BB L.O. to sweep it over the desired frequency range as determined by the test mode switches. While auto scanning the front panel frequency controls are disconnected from the BB L.O.

The power supply has a dual primary transformer capable of 115/230V, 50/60 Hz operation. The ±15V raw supplies are configured as full wave center tapped rectifiers. The ±15V regulator is a dual tracking regulator which drives series pass transistors located on the back panel. The ±15V regulator will shut down if current in excess of the limit set by external resistors is exceeded. The +5V raw supply is a full wave bridge rectifier. After the raw supply the +5V supply is split with the front panel, counter and A/D converter boards being served by a three terminal regulator located on the rear panel and the other boards being served by a three terminal regulator located on the power supply board. Both +5V regulators have internal thermal protection against over current conditions. Over voltage protection for all supplies is provided by hybrid crowbar circuits which fire when the supply voltage exceeds approximately 120% of nominal value.

#### 4.3.2.1 DE-EMPHASIS NETWORK MODULE

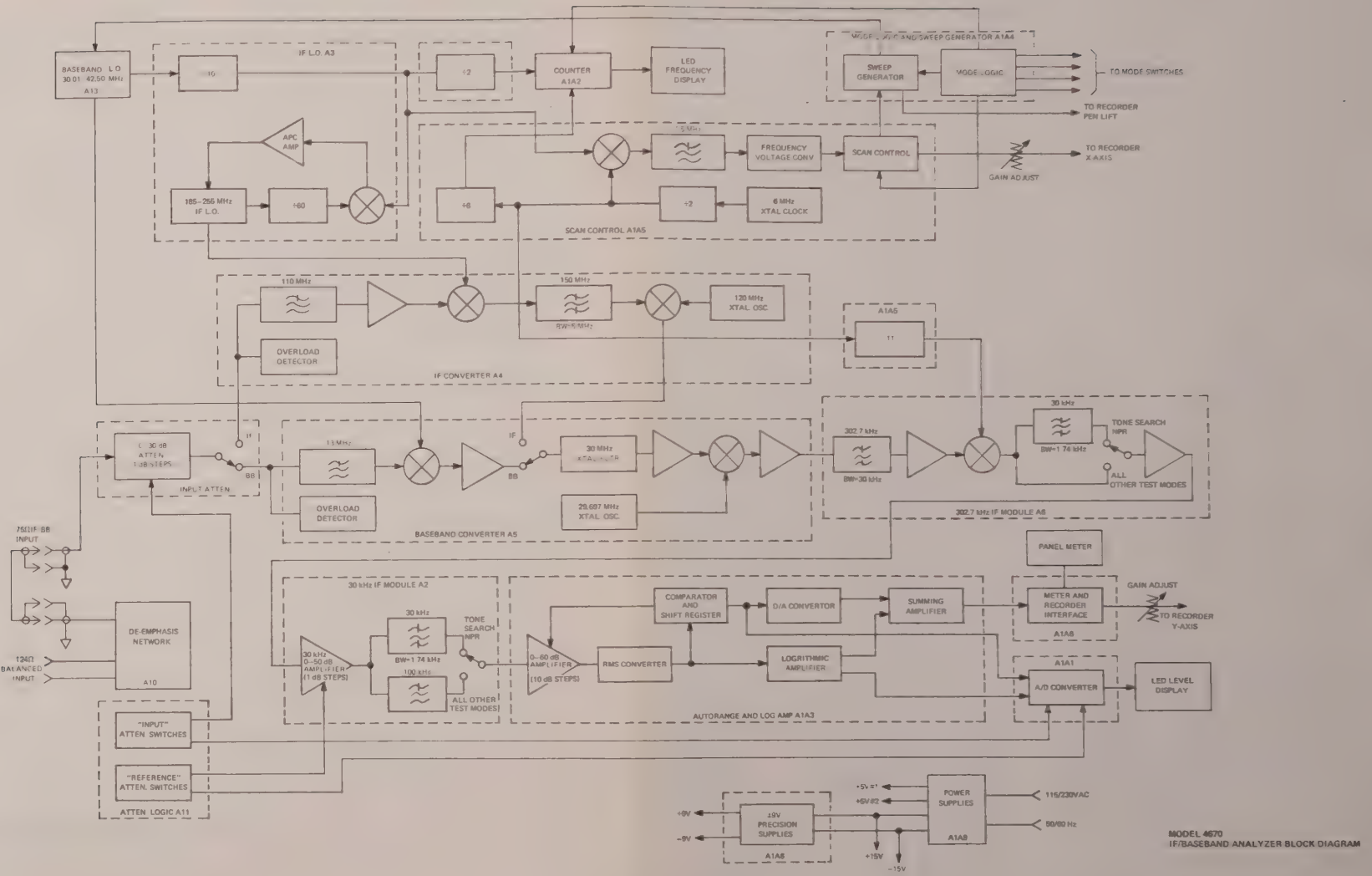
The de-emphasis unit contains a 75/124 ohm unbalanced-to-balanced transformer and a constant-impedance de-emphasis network. The 124 ohm winding is connected to J1 and J2. The 75 ohm winding is connected to J3. The characteristic impedance of the de-emphasis network is 75 ohms. The de-emphasis network is connected between J4 and J5.

#### 4.3.2.2 ATTENUATOR MODULE

The purpose of the attenuator module is to attenuate input signals greater than −20 dBm to prevent overloading the IF or baseband converters. The attenuator operates from dc to 105 MHz and provides up to 30 dB attenuation in 1 dB steps.

The attenuator is comprised of a five-bit binary network with attenuator pads of 1 dB through 16 dB. Each pad is relay switched. The attenuator is controlled by the attenuator logic assembly A11 which provides the necessary decimal-to-binary decoding.

The front panel IF/BB input connector connects through the de-emphasis module to J1 of the attenuator. The output of the attenuator is connected through J3 to the baseband converter and through J2 to the IF converter.




MODEL 4670
IF/BASEBAND ANALYZER BLOCK DIAGRAM

### 4.3.2.3 ATTENUATOR LOGIC

This assembly is the interface between the programmable input attenuator. It is also the programmable reference amplifier in the 30 kHz IF assembly. The positions of the input rotary switches are encoded from decimal to binary for the input switches and from decimal to BCD for the reference switches. The input switches are summed together and the reference switches are summed together to provide a 5 bit binary and 7 bit BCD positive true logic outputs to interface with the input attenuator, the 30 kHz reference amplifier and the A/D arithmetic assembly.

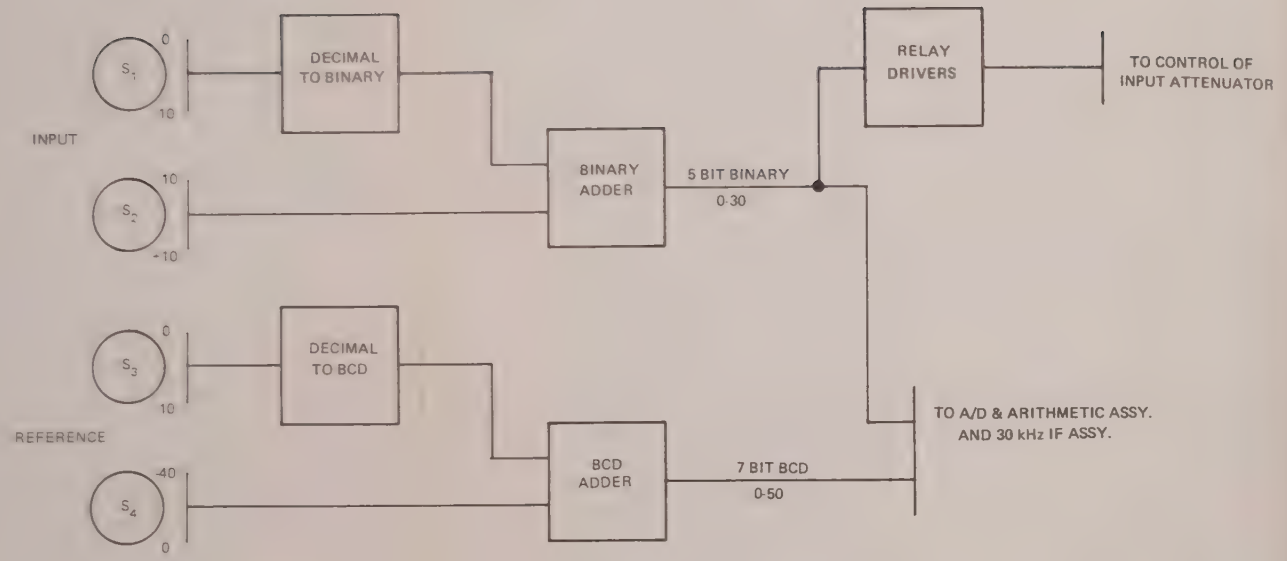
The attenuator logic assembly is a PWB to interface the level selection switches on the front panel with the arithmetic circuitry on the A/D & Arithmetic Assembly input attenuator and reference amplifier (30 kHz IF Assy).

Selector switches S1 and S2 are encoded to binary and added to provide five bit binary outputs (0 to 30). Selector switches S3 and S4 are encoded to BCD and added to provide seven bit BCD (0 to 50).

If S1 and S2 are turned clockwise to their stops, the binary output will be 0; if counter-clockwise, the output will be 30.

If S3 and S4 are turned clockwise to their stops, the BCD output will be 50, if counter-clockwise, the output will be 0.

Q1 through Q5 are relay drivers to select binary steps of the input attenuator. Q6 is a relay driver to switch the input signal to the baseband converter of IF converter as selected by the front panel mode select switches.




ATTENUATOR LOGIC ASSEMBLY BLOCK DIAGRAM

### 4.3.2.4 BASEBAND LOCAL OSCILLATOR

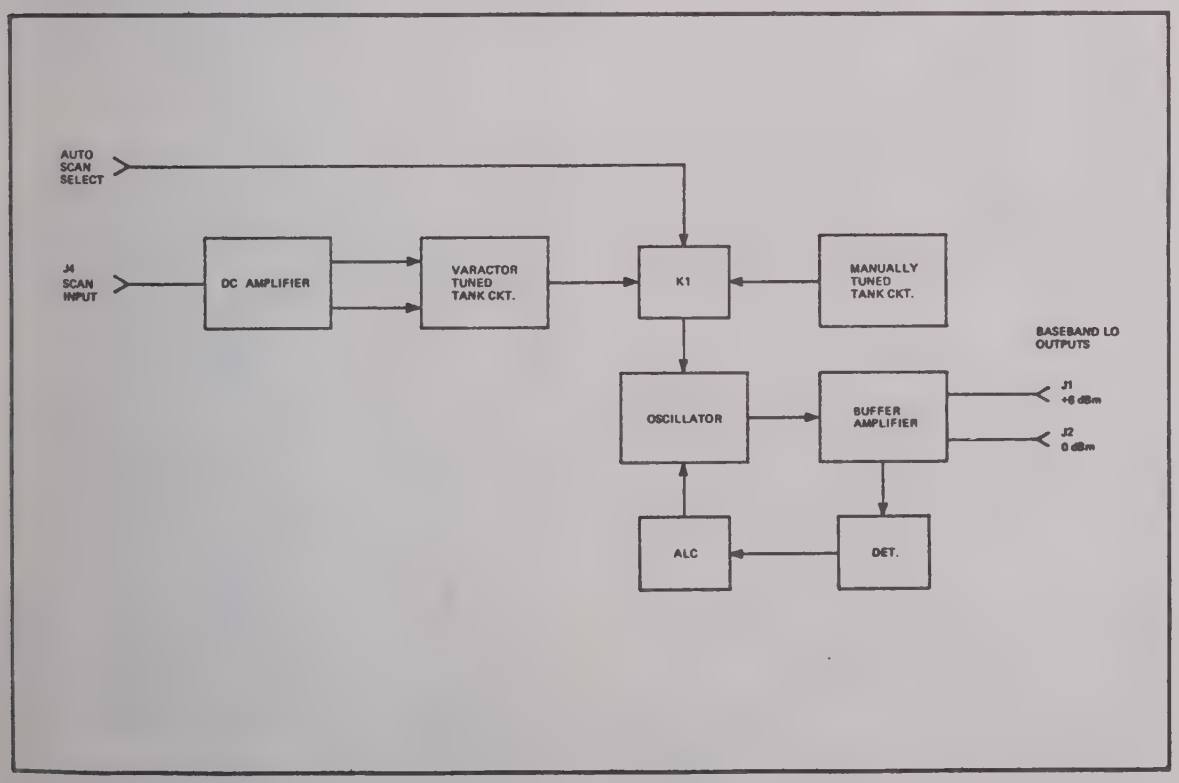
The baseband local oscillator, BB L.O., provides the local oscillator signal for the baseband converter which converts the 10 kHz to 12.5 MHz baseband signal up to a 30 MHz IF signal. The BB L.O. also serves as the reference for the phase-lockec loop in the IF local oscillator. The BB L.O's multi-turn tuning capacitor and fine tuning potentiometer are front panel mounted controls.

In the manual mode the tank circuit of L5 and the main tuning capacitor, C1, is connected to the oscillator circuit comprised of Q3 and Q4 by means of energized relay K2. Fine frequency adjustment is accomplished by the front panel mounted 10K potentiometer in conjunction with L4. In the manual mode the output of the oscillator varies from 30.01 MHz to 42.50 MHz which corresponds to baseband signals of 10 kHz to 12.5 MHz.

In the auto scan mode Q1 is turned off, de-energizing relays K1 and K2. This action disconnects the tank circuit of L5 and C1 and connects the tank circuit consisting of L2 and varactor diodes CR3 through CR6 to the oscillator. The scan input signal from the sweep generator card, A1A4, varies the bias on the varactor diodes and hence their capacitance U1A and U1B are unity gain amplifiers used to provide isolation and low impedance source to drive the varactor diodes. The output frequency varies from 30.06 MHz to 42.50 MHz in the auto scan mode.

Transistors Q5, Q6, and Q7 form a non-inverting amplifier for the oscillator's signal. Gain is set by R18 and R20. The output at Q7 emitter is +6 dBm which goes to the baseband convertor. A voltage divider comprised of R23 and R24 reduces the oscillator's signal to 0 dBm which goes to the IF local oscillator.

CR2 and U2 form an ALC loop which varies the bias on the oscillator by means of Q2. In this manner, the output of the BB L.O. is held constant over its entire tuning range.



### 4.3.2.5 BASEBAND CONVERTER MODULE

A block diagram of the baseband converter is given below. The baseband converter receives baseband signals and upconverts the signal to a 30 MHz IF. The IF signal is amplified and passed through a 30 MHz crystal filter. The output of the crystal filter is amplified and mixed down to the second IF of 302.7 kHz. This IF signal is amplified and fed to the 302.7 kHz module.

When the 4670-1 is operated in the IF mode, the 30 MHz IF output from the IF converter module is fed to the baseband converter and then through K1 to the 30 MHz crystal filter. The signal is then processed in the same manner as the IF signals in the baseband mode of operation.

The baseband mode of operation is selected by applying +5V to C1. That reverse biases CR1 and allows the current through R1 to turn on Q1 and energize K1. The IF mode is selected by applying 0 volts to C1 causing Q1 to be cut off and K1 to be de-energized.

The baseband input at J1 is passed through a 14 MHz low-pass filter consisting of L8 - L10 and C19 - C25. This filter suppresses out-of-band signals and reduces spurious responses that could be caused by an out-of-band input. The 14 MHz low-pass filter also attenuates the LO signal that feeds through the mixer CR3. The LO signal must be attenuated to less than -75 dBm at J1.

The output of the 14 MHz low-pass filter is fed through two equalizer networks consisting of C26, C27, L11, L13, and R16-R20. The second equalizer compensates for the loss in 14 MHz low-pass filter and mixer response. The output of the equalizer is fed to the mixer CR3.

The IF output of the mixer CR3 is fed to a buffer amplifier consisting of Q2 and Q3. The gain of this feedback pair is 8.7 dB.

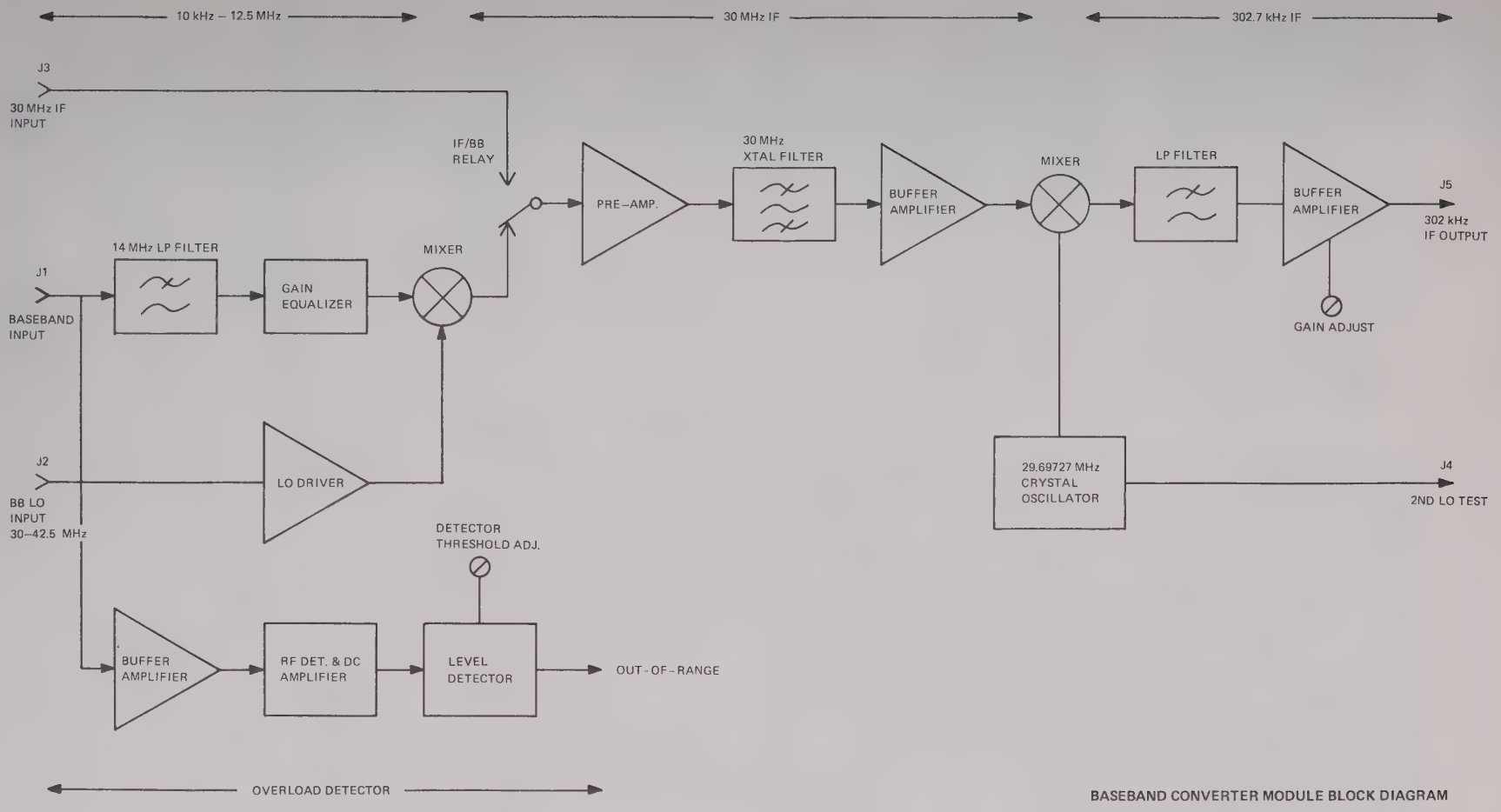
In the baseband mode of operation K1 is energized and the output of Q3 is fed through C11 and K1 to the 30 MHz crystal filter. The crystal filter consists of a tandem pair of monolythic crystals Y2A and Y2B and matching networks. The impedance of the crystal filter is matched to the source and load by input matching network consisting of C29, C30, and L13 and output matching network C32, C33, and L14. The coupling reactance is adjusted by C31 and L21.

The local oscillator drive for the second mixer CR4 is obtained from the 29.69727 MHz crystal oscillator (Q4 and associated components). This oscillator is a Colpitts type with the crystal Y1 in series with the emitter feedback. The output of Q4 is fed through low-pass filter L7 and C64 to pin 8 of mixer CR4.

The IF output from mixer CR4 is fed through a low-pass filter (C57, L16, C50, C65) to the 302 kHz amplifier consisting of U3, Q10, and associated components. U3 is an integrated circuit differential amplifier. The output of the amplifier is fed back from the emitter of Q10 through R64 to the inverting input of U3.

The baseband local oscillator input is applied to J2. The LO frequency range is 30.01-42.5 MHz and input power is +6 dBm. The LO input is amplified by the LO driver Q6 and Q7 to +23 dBm and delivered to pin 8 of mixer CR3.

A sample of the baseband input at J1 is fed through C44 to the overload detector. The signal is buffered by the feedback pair Q8 and Q9. The output from Q9 is fed through C46 to the rectifier U2. U2 consists of a pair of temperature-controlled matched transistors operating at elevated temperature. The transistors are connected as diodes. A bias current is supplied through R50 to the diode section between pins 1, 9, and 10 of U2. The ac baseband signal is also applied across this diode. As the baseband signal amplitude increases, the diode impedance decreases, and the dc voltage at pins 1 and 9 goes in a negative direction (becomes less positive). When this voltage becomes less than the voltage on pins 2 and 4, the output of the amplifier U1 goes positive indicating an overload. The trip point is set by adjusting R49.




BASEBAND CONVERTER MODULE BLOCK DIAGRAM

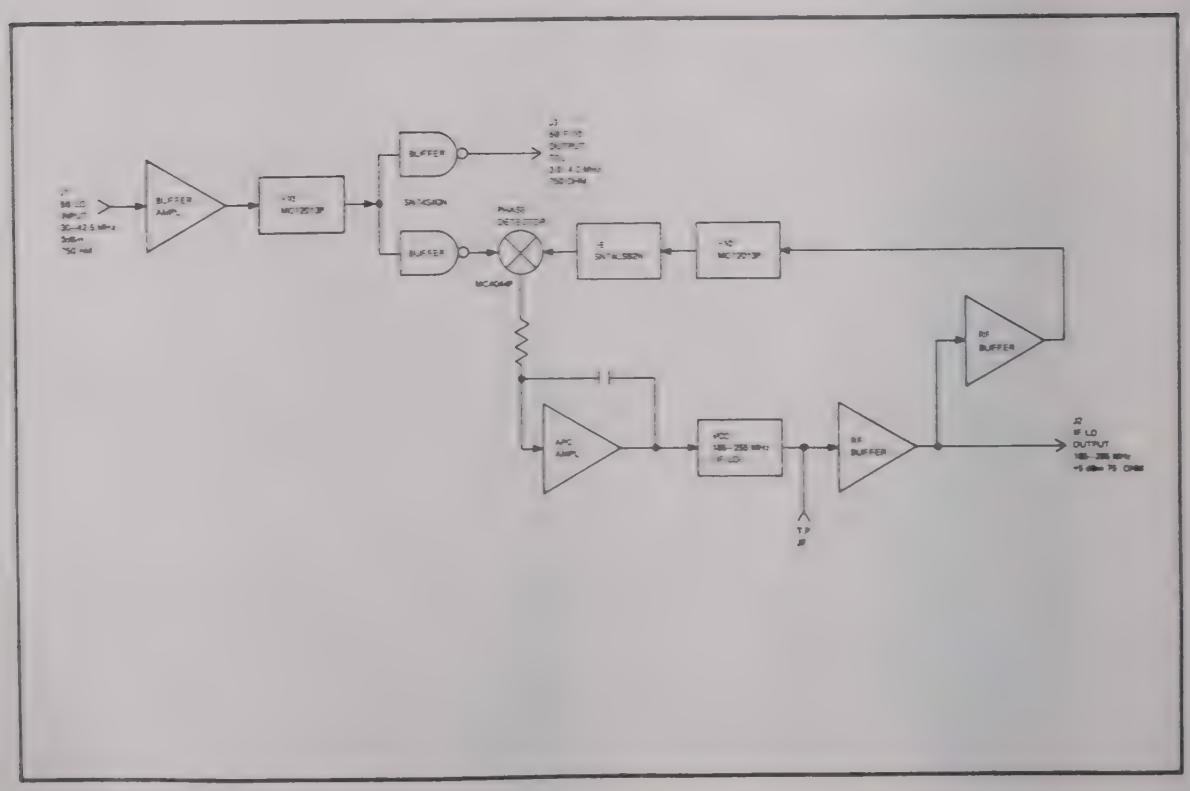
### 4.3.2.6 IF L.O. MODULE

The Baseband L.O. input of 30 to 42.5 MHz is coupled through a buffer amplifier to a MECL decode divide-by-10 counter. Output signals from the counter are provided by a TTL dual Nand buffer. One output is routed to the BB F/10 output and the other is routed to the digital phase detector.

The other digital phase detector input is derived from the divide-by-60 chain consisting of a MECL divide-by-10 IC and a TTL divide-by-6 IC. The input to the divide-by-10 IC is provided by the buffer amplifier connected to the IF L.O. output signal line.

The error signal output from the digital phase detector is filtered by the integrator form about the APC amplifier and is then coupled to the varactor control diodes in the VCO 185–255 MHz circuit. The VCO circuit is isolated from the IF L.O. output jack by a buffer amplifier.

The VCO digital frequency control loop acts like a AFC loop to achieve lock then a type 2 APC loop after acquisition of lock.


BUFFER
BUFFER
BUFFER

### 4.3.2.7 IF CONVERTER MODULE

Input signals within the IF mode frequency range of 35 to 105 MHz are filtered by a ninth order Cauer elliptic 110 MHz low pass filter. The signals are then coupled through a buffer amplifier to a double-balanced mixer where they are upconverted to a 150 MHz frequency as the IF L.O. input to the mixer is tuned over its range of 185 to 255 MHz.

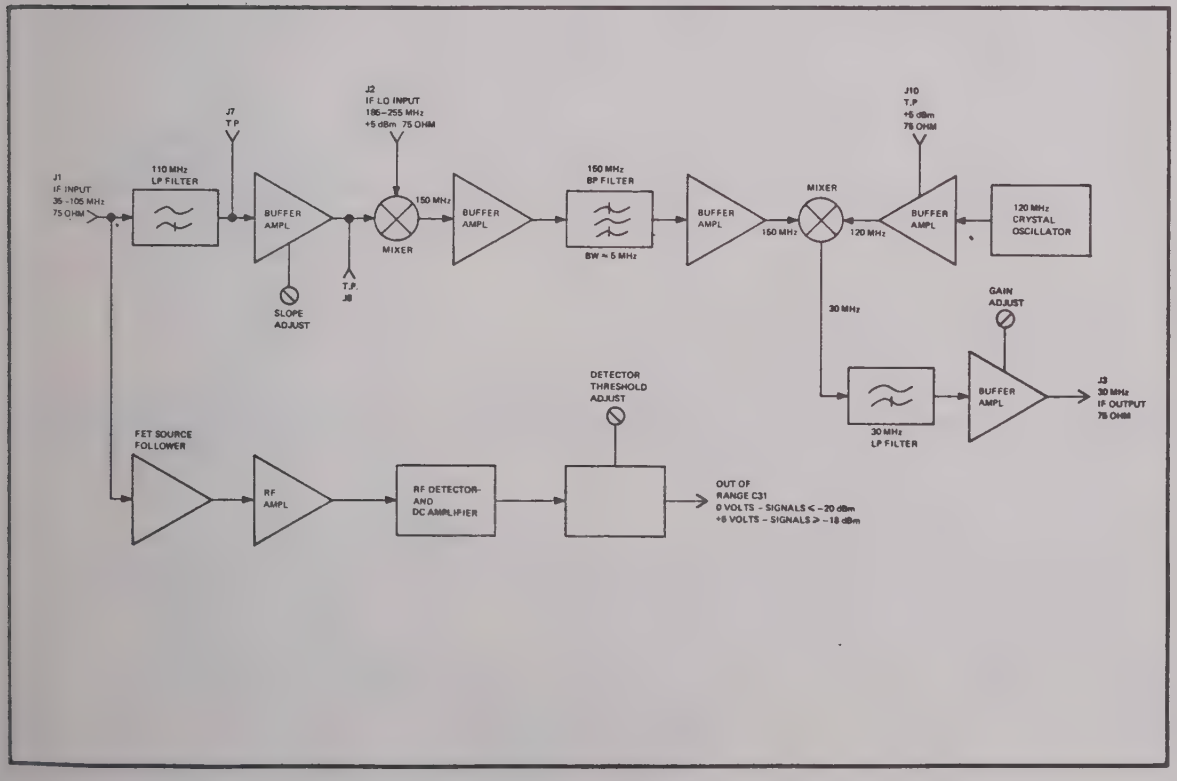
The input buffer amplifier is designed for low signal distortion and large input return loss. Its slope adjust control allows the 35 to 105 MHz amplitude frequency response of the buffer amplifier to be adjusted to cancel slope amplitude errors caused by the low pass filter and the analyzer's input attenuator.

The upconverted 150 MHz signals are filtered by a 150 MHz double-tuned bandpass filter before being downconverted by a second double-balanced mixer to 30 MHz signals. Additional isolation between the two mixers is provided by the two buffer amplifiers, on one on each side of the bandpass filter.

The L.O. drive for the second downconverter mixer is generated by a 120 MHz crystal oscillator which is isolated from the mixer by a buffer amplifier.

Signals from the second mixer are filtered by a 30 MHz low pass filter and then coupled through a gain adjustable buffer amplifier to the 30 MHz output jack. The gain adjust on the buffer amplifier is used to set the overall conversion gain of the module to typically 0 dB.

The OUT OF RANGE (amplitude) detection circuits consist of a FET source follower, RF amplifier, RF detector and dc amplifier, and a level detector. The detector threshold adjusts to provide an out-of-range output signal of +6 volts for module input – signals greater than –18 dBm.



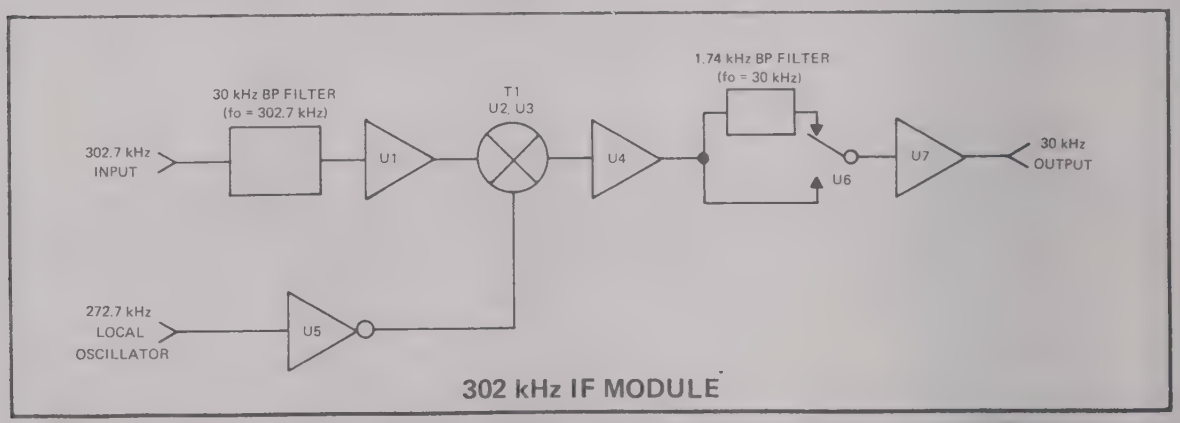
### 4.3.2.8 302 kHz IF MODULE

The 302.7 kHz IF module provides filtering and frequency translation for the 302.7 kHz signal from the Baseband Converter. The input signal first passes through a 30 kHz bandpass filter which is centered about 302.7 kHz. Amplifier U1 is a buffer amplifier which compensates for the insertion loss of the 30 kHz filter. T1, U2, and U3 comprise a mixer whose output is 30 kHz. Mixing is accomplished by alternately turning on a shunt-series pair of CMOS switches (U2 and U3) with the local oscillator signal. Amplifier U4 compensates for the loss in the mixer and also has a high frequency roll off to help suppress the local oscillator signal. From U4 the signal either goes through a 1.74 kHz bandpass filter or directly to the output amplifier, U7. U7 has two gain controls, R19 and R21 so that the gain of the module can be adjusted to 0 dB whether the 1.74 kHz filter is selected or not.

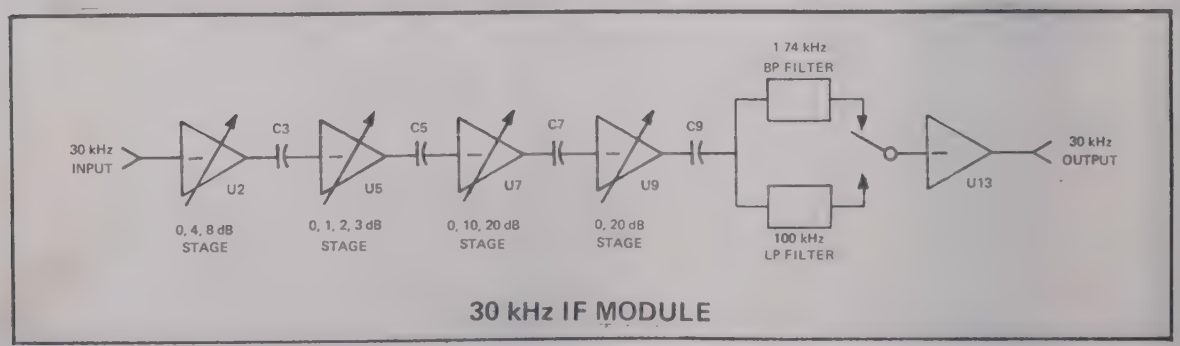
### 4.3.2.9 30 kHz IF MODULE

The 30 kHz IF module is basically a switched gain amplifier which provides 0 to 50 dB of gain in 1 dB increments. Its frequency response is flat over the passband of 15 kHz to 45 kHz. One of two filters is selected depending upon the mode of operation. A 1.74 kHz bandpass filter is selected for the Tone Search mode. A 100 kHz low pass filter is selected for the Baseband and NPR modes. This filter further reduces the 272.7 kHz local oscillator signal from the 302.7 kHz IF module.

A three section CMOS switch is connected in a series-shunt arrangement switching in various summing and feedback resistors. In the figure shown, series switch U1A is closed as is shunt switches U1B and U1C. Shunt switches U1B and U1C ground any signals coming in on summing resistors R3 and R6 while series switch U1A connects the junction of R1 and R2 to the inverting input of U2. Only one series switch is closed at a given time while all of the other shunt switches are closed. R4 and R7 provide adjustment so that the gain can be precisely set. Gain adjustments are also provided for the filters to compensate for their insertion loss.



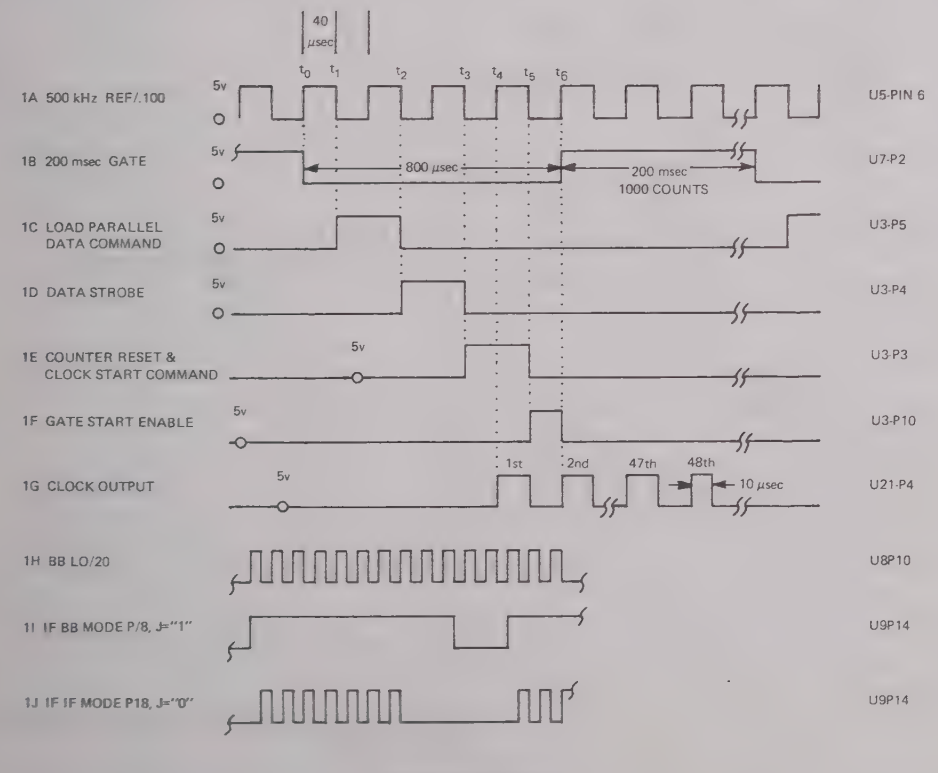

302 kHz IF MODULE



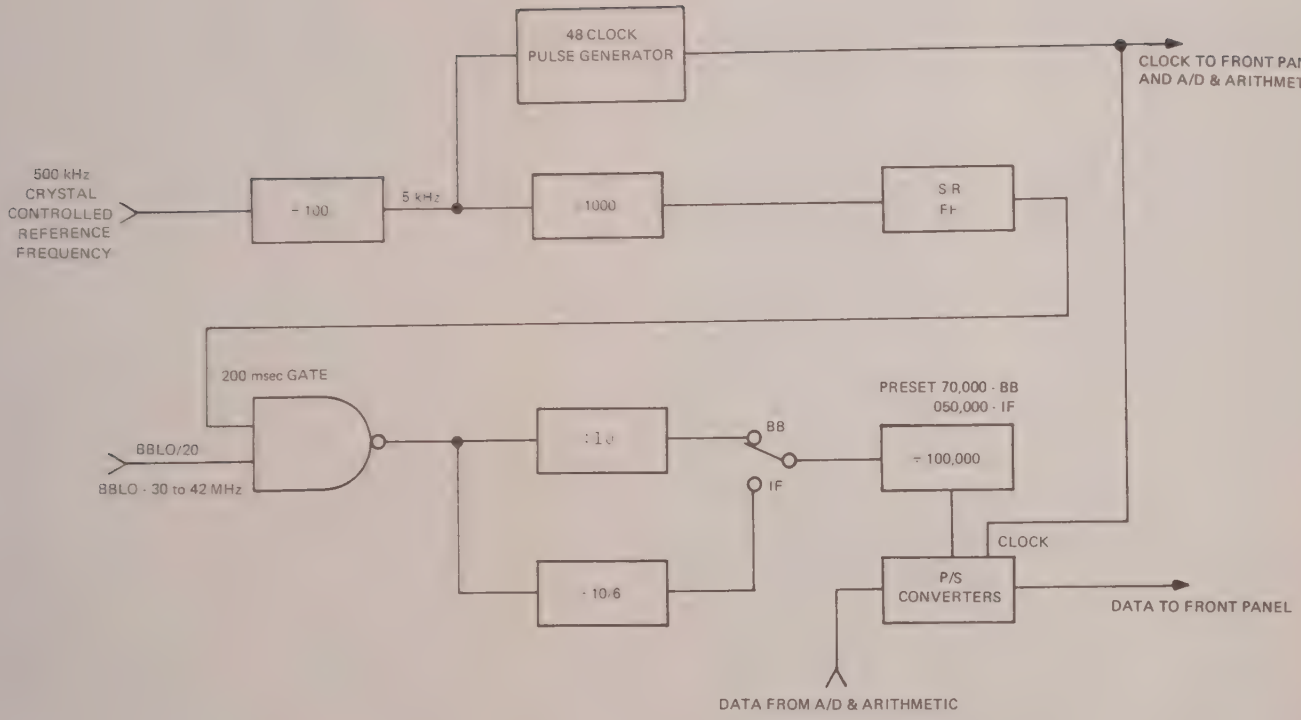

30 kHz IF MODULE

## 4.3.2.10 COUNTER ASSEMBLY

The counter uses a 500 kHz crystal control reference frequency to generate a 200 millisecond sampling gate. This is used to sample the subdivided baseband L.O. The first divider after the sampling gate is a divide-by-10 in baseband or a divide-by-1.67 if in IF. This gives the proper count sequence (the IF L.O. is a phase-lock source which is a multiple of 6 times the baseband L.O.). The divide circuits following the IF baseband switch are divide-by-10's with presets. The counter is preset to correct for the first baseband IF L.O. and the first IF L.O. in the baseband and IF converter respectively. At the end of the 200 millisecond sampling gate, the data in the divide chain is loaded into the parallel to serial shift registers and a 48 pulse generator shifts this serial data to the front panel display assembly. It also loads in data from the A/D arithmetic assembly to shift that data through the parallel serial registers on the counter assembly.




Counter Timing Diagram

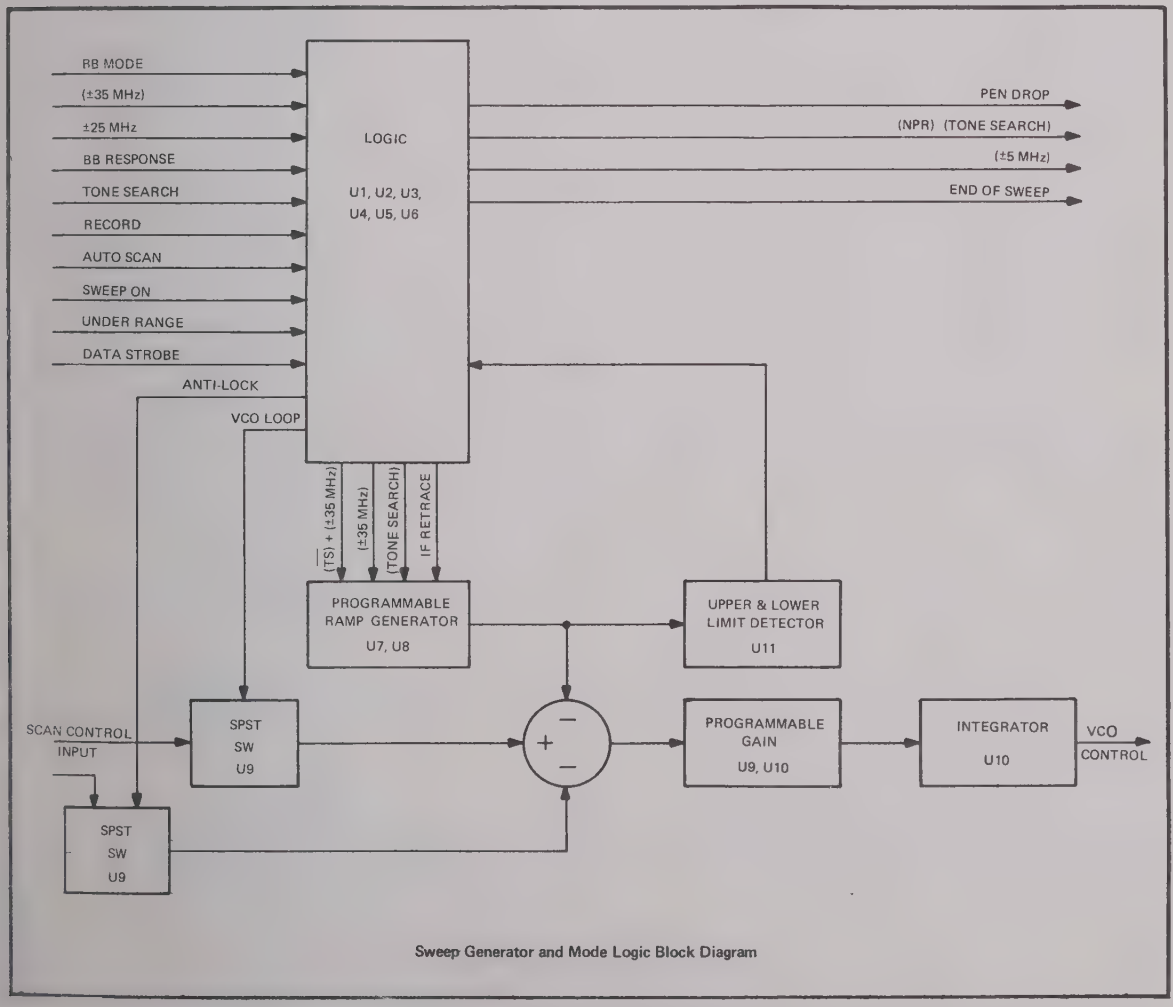



COUNTER ASSEMBLY BLOCK DIAGRAM

### 4.3.2.11 SWEEP GENERATOR & MODE LOGIC

The Sweep Generator and Mode Logic Board provides the generation of the various sweep speeds in the auto scan mode, provides a summing amplifier which sets the gain in the baseband local oscillator VCO loop, and provides logic circuitry to generate various logic signals needed to switch analog circuitry in the various modes of operation.

The mode logic, comprising U1 through U6, accepts the switching mode commands from the lamp logic board on the front panel. These signals are: BB mode (true when any baseband mode is selected), ±35 MHz (true when when 70 ±35 MHz is selected), ±25 MHz (true when 70 ±25 MHz is selected). BB Response (true when BB Response is selected), RECORD (true when Record is selected), SWEEP ON (true when Auto Scan and Record are both selected). These inputs are combined with data generated on this board, upper and lower scan limits, and control the VCO loop gain, the auto scan sweep times and sweep direction, and generate other logic functions (pen drop, (NPR) and (Tone Search, (±5 MHz) and (End of Sweep)), which are used elsewhere in the system. The logic also accepts an Under Range signal and a Data Strobe from the counter board and prevents the VCO from locking up on the wrong sideband of the baseband local oscillator.



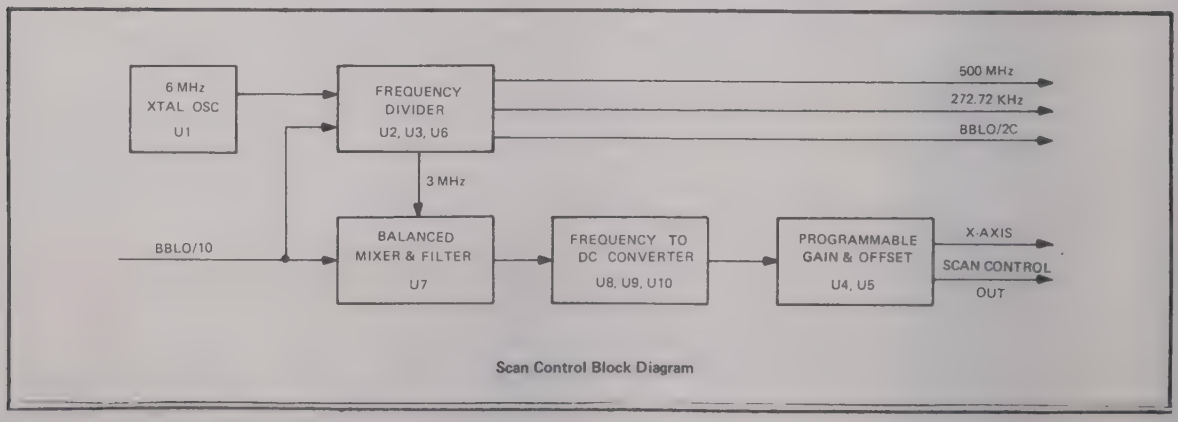

Sweep Generator and Mode Logic Block Diagram

The programmable ramp generator consisting of U7 and U8 generates a negative going ramp. The time it takes this signal to go from its lower limit to its upper limit is a function of the selected mode. In every mode except Tone Search or 70 ±35 MHz the foward sweep time is nominally 45 seconds. In the 70 ±35 MHz mode the foward sweep time is nominally 70 seconds and in Tone Search the foward sweep time is nominally 180 seconds. In all baseband modes the retrace time is limited only by the recorder response, but in all IF modes the retrace time is slowed down to prevent the phase lock loop in the IF local oscillator from losing lock.

When in the auto scan mode, the dc voltage which is proportional to the frequency generated on the Scan Control board is summed with the sweep signal in amplifier, U10, and applied to an integrator providing the control voltage for the Baseband local oscillator VCO. CMOS switch, U9, changes loop gain for the various modes. U9 also switches an anti-lock signal when commanded by the logic driving the VCO to the correct starting frequency. U11 detects the upper and lower scan limits and is applied to the logic.

### 4.3.2.12 SCAN CONTROL

The Scan Control Board provides for the translation of the Baseband local oscillator frequency divided by 10 (BB LO/10), to a dc voltage controlling the baseband local oscillator VCO loop. The board also provides various signals used as reference frequencies in the system. The crystal oscillator, U1, generates a precise 6 MHz signal which is applied to frequency divider circuits, U2, U3, and U6, providing signals whose frequencies are: 3 MHz, 500 MHz and 272.72 kHz. The BB LO/10 input signal from the IF LO Module is divided by two, generating the BB LO/20 output. Both the 3 MHz signal and the BB LO/10 input signal are applied to a balanced mixer and filter, U7. The frequency of the BB LO/10 input varies from 3 to 4.25 MHz, as the instrument is tuned over its dynamic range. The output of the mixer varies from 0 to 1.25 MHz proportionally to baseband local oscillator frequency in either the manually tuned mode or VCO mode. This signal is applied to a frequency to dc voltage converter, U8, U9, U10. The output of the converter passes through a programmable gain stage, U5. The gain and offset of this stage is selected by CMOS switches, U4. The gains and offsets are different for different scan widths and starting points in the various auto scan modes. The output signals are derived from U5. The "X Axis Output" drives the X-Axis of the X-Y Recorder, and the "Scan Control Output" is applied to the Sweep Generator and Mode Logic board controlling the closed VCO loop when in the auto scan mode.

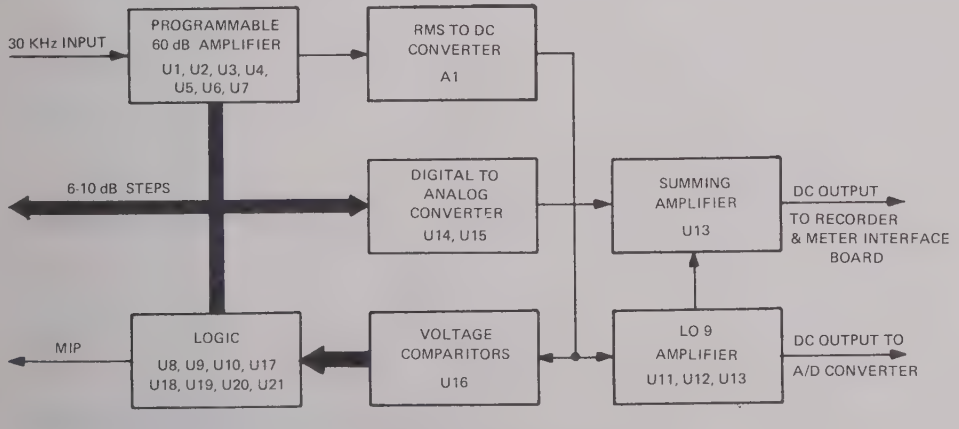



Scan Control Block Diagram

### 4.3.2.13 AUTO RANGE and LOG AMPLIFIER

The Auto Range and Log Amplifier board accepts amplitude data at 30 kHz, amplifies, detects this signal and outputs a dc voltage which is equivalent to the logarithm of the true RMS value of the input signal.

The input from the 30 kHz IF module is applied to the input of a programmable 60 dB amplifier. This amplifier consists of three stages of gain with each one capable of producing a gain of 0 dB, 10 dB, or 20 dB. Up to 60 dB of gain can be programmed in 10 dB steps. The gain of each stage is controlled by internal logic circuitry. The output of this amplifier is applied to a true RMS detector, which converts the 30 kHz signal to a dc voltage. The output of the RMS detector is sensed by the voltage comparators and applied to the logic circuitry. If the dc voltage is not within a predetermined range, the logic circuitry commands the gain of the 60 dB amplifier to change in 10 dB steps until either the dc voltage is within range or all the gain stages are either all switched in or out. The six lines commanding the 10 dB gain steps are output to the A/D arithmetic board and are also converted to a dc voltage in the digital to analog converter on this board. Each 10 dB step is converted to a dc voltage proportional to 10 dB. In this manner, the output of the RMS detector is normalized to 10 dB over its dynamic range. The remaining dc output signal is converted to a logarithmic equivalent by the log amplifier. The output of the logarithmic amplifier is summed with the output of the digital to analog converter, thusly producing a 70 dB dynamic range. This output is applied to the recorder and meter interface board for further processing before being applied to the analog meter and the recorder. The output of the logarithmic amplifier along with the six dB logic lines are output to the A/D arithmetic board for further processing before being applied to the digital readout on the front panel.


30 KHz INPUT
PROGRAMMABLE 60 dB AMPLIFIER U1, U2, U3, U4, U5, U6, U7
RMS TO DC CONVERTER A1
6-10 dB STEPS
DIGITAL TO ANALOG CONVERTER U14, U15
SUMMING AMPLIFIER U13
DC OUTPUT TO RECORDER & METER INTERFACE BOARD
MIP
LOGIC U8, U9, U10, U17 U18, U19, U20, U21
VOLTAGE COMPARITORS U16
LO 9 AMPLIFIER U11, U12, U13
DC OUTPUT TO A/D CONVERTER

Auto Range and Log Amplifier Block Diagram

### 4.3.2.16 DISPLAY INTERFACE

The Display Interface Assembly converts 48-bit serial data into parallel data to drive level and frequency display on the front panel. The assembly consists of two PWB's the Display Interface PWB. both of which are shown on the same schematic. (See Chapter 7)

Serial data and clock are generated by the Counter PWB. The serial data is loaded into the serial to parallel registers by the 48 pulse clock. The data is delayed into the registers by the R1C1 network as shown in Figures a and b in the timing diagram to eliminate any race conditions.

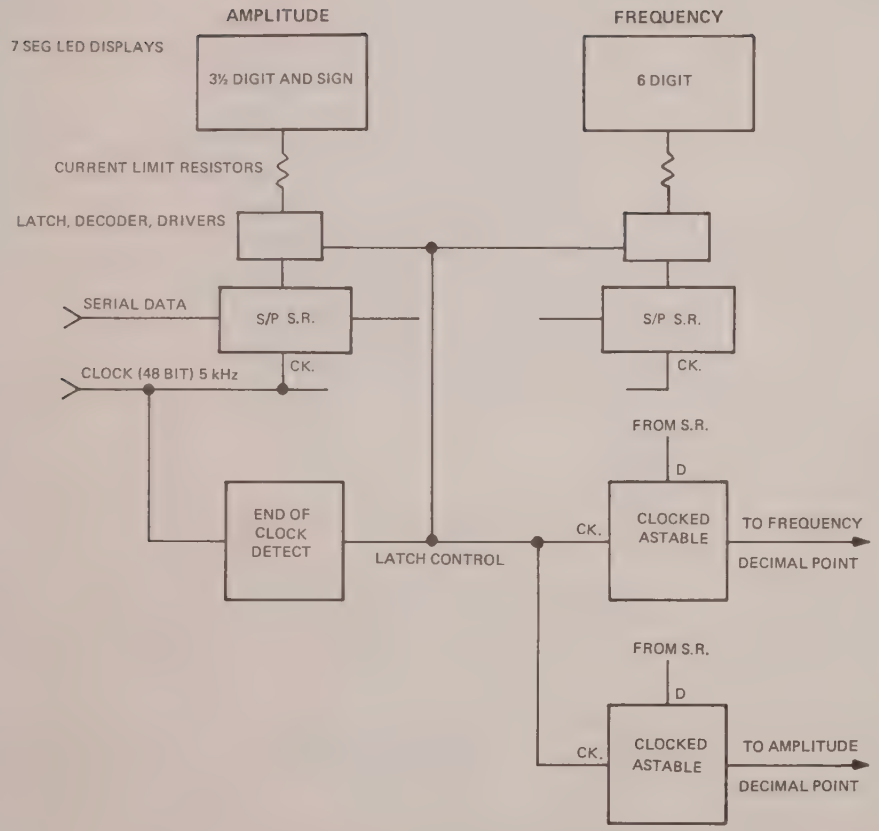
The end-of-clock detector is a dual retriggerable monostable with outputs shown in Figure d and 1e. The store command (Figure e) allows parallel data to be latched into the latch/decoder/drivers (U9. U10, U11, U12, U24, U25. U26. U27, U28 & U29) and into the blanking latches (U4 & U8).

Two gatable 3 Hz/sec (± 30%) astables made up of U10 and U11 drive the undertuned and out-of-range decimal point drivers.

The meter scale lamps and their drivers are controlled by the BB response mode select output. When in BB response, the 10 dB lamp is illuminated; when in any other mode, the 70 dB lamp is illuminated.

The lamp test switch will cause all segments to be lighted on the LED displays when pushed with the exception of only the "1" being lighted in the MSD position on both level and frequency display.

The decimal points on the amplitude and frequency displays will flash when certain conditions exist. On the amplitude display, when there is a signal large enough to saturate the front end of the instrument, the decimal points will flash. Also, if there is no input signal on the front end of the instrument, a decimal point flash. The frequency display decimal points will only flash when the operator manually tunes the instrument lower than it will operate.




DISPLAY INTERFACE ASSEMBLY BLOCK DIAGRAM

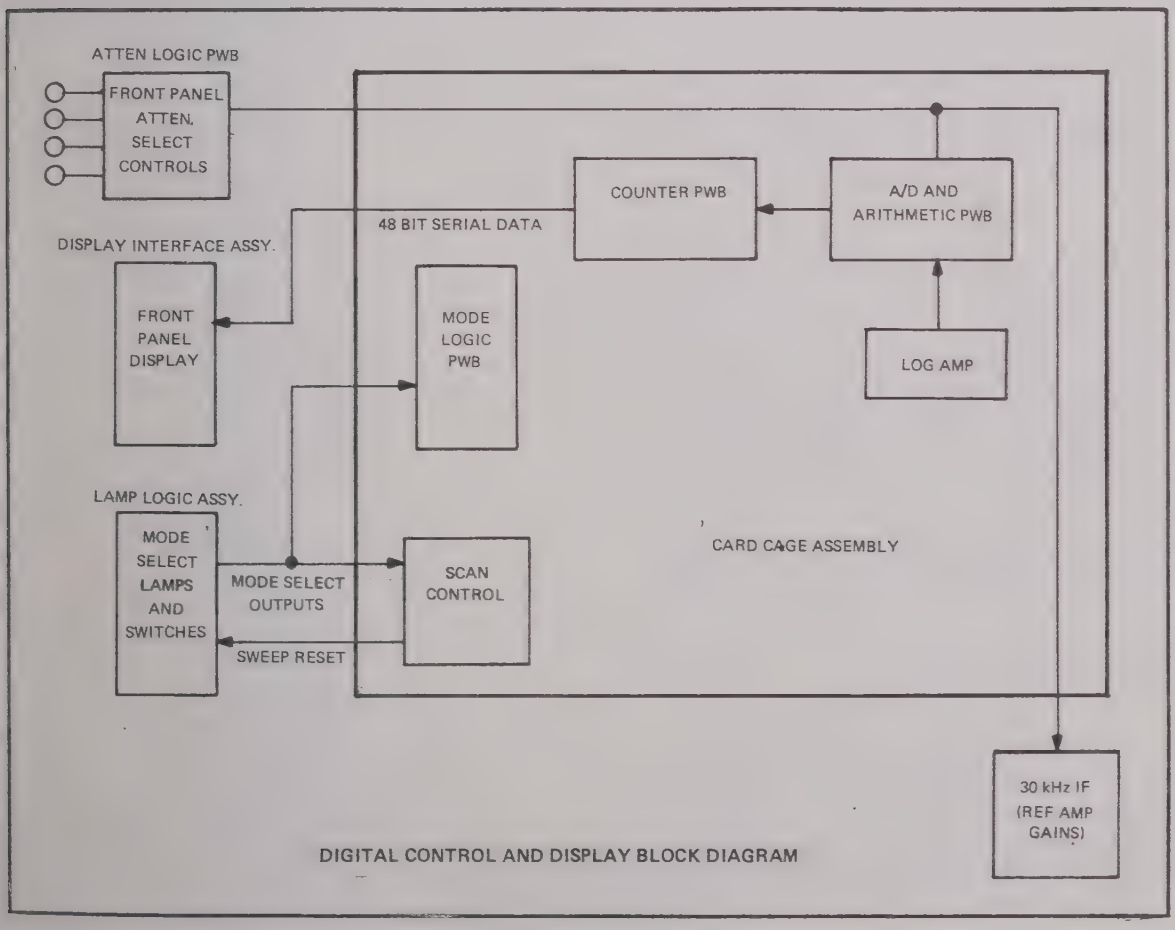
## 4.3.2.17 DIGITAL DISPLAY

This discussion covers the digital control and display. Subsequent subsections include the attenuator logic assembly to display interface assembly, lamp logic assembly, a counter assembly, and the A/D arithmetic assembly.

The front panel assemblies include the display interface assembly which has the frequency and analog direct reading displays, the lamp logic assembly which includes the interlock logic for selection of modes with momentary switches on the front panel, and the lamps to indicate the mode selected on the attenuator logic assembly. The attenuator logic assembly is controlled by front panel rotary switches to select input attenuation and reference amplifier gains. It also inputs digital data into the A/D arithmetic assembly to allow computation of signal level based on input and reference attenuator settings.

The card cage assembly contains the counter assembly, the A/D arithmetic assembly, the mode logic assembly, the scan control assembly. These assemblies all interconnect to control the instrument, measure frequency and amplitude, and output data.

The counter assembly effectively measures the center frequency of the Model 4670 selectable passband and the A/D arithmetic with the auto ranging amplifier output which measures the signal level in that selectable passband. The counter and the A/D arithmetic assemblies formulate their data into a 48-bit serial data stream. This is transmitted to the front panel display card at a 5 kHz data rate 5 times per second.




DIGITAL CONTROL AND DISPLAY BLOCK DIAGRAM

#### 4.3.2.18 LAMP LOGIC

The lamp logic assembly comprises of two PC cards, the lamp logic PWB, and the interlock logic PWB. The interlock logic PWB is a hex stable circuit for 1 of 6 selcctors. Its inputs are the front panel IF and baseband select switches. It allows selection of one IF or baseband mode. The lamp logic PWB contains the indicating lamps and lamp drivers to light the panel, showing the mode selected. This card has a manual and automatic bistable circuit to select the manual or automatic mode.

Operationally, when in the manual mode, pressing the RECORD switch will cause the pen on the recorder to drop. Pressing the RECORD switch again will cause the pen on the recorder to raise. When in automatic mode, pressing RECORD will drop the pen and also initiate the beginning of the sweep. Pressing RECORD the second time will raise the pen and reset recorder to its start position on the left side of the grid paper. This circuit is prebiased. At turn on, the instrument will initially be in the manual mode with the RECORD function off and with baseband in NPR.

#### 4.3.2.19 INTERLOCK LOGIC

The Interlock Logic PWB is a one-of-six selector. Connection of a switch input to ground will cause the other switch inputs to be logic "1". The lamp output associated with each switch will be a logic "1" when its switch has been selected.

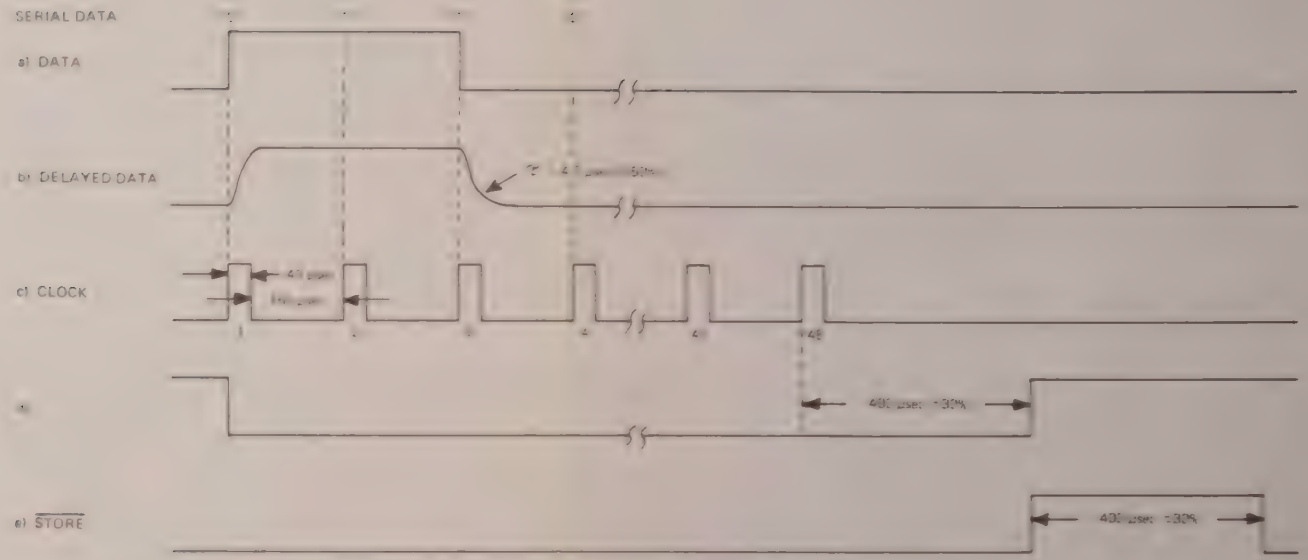
The R.C. network is a turn-on network which causes the instrument to power up in the NPR Mode.

#### 4.3.2.20 LAMP LOGIC

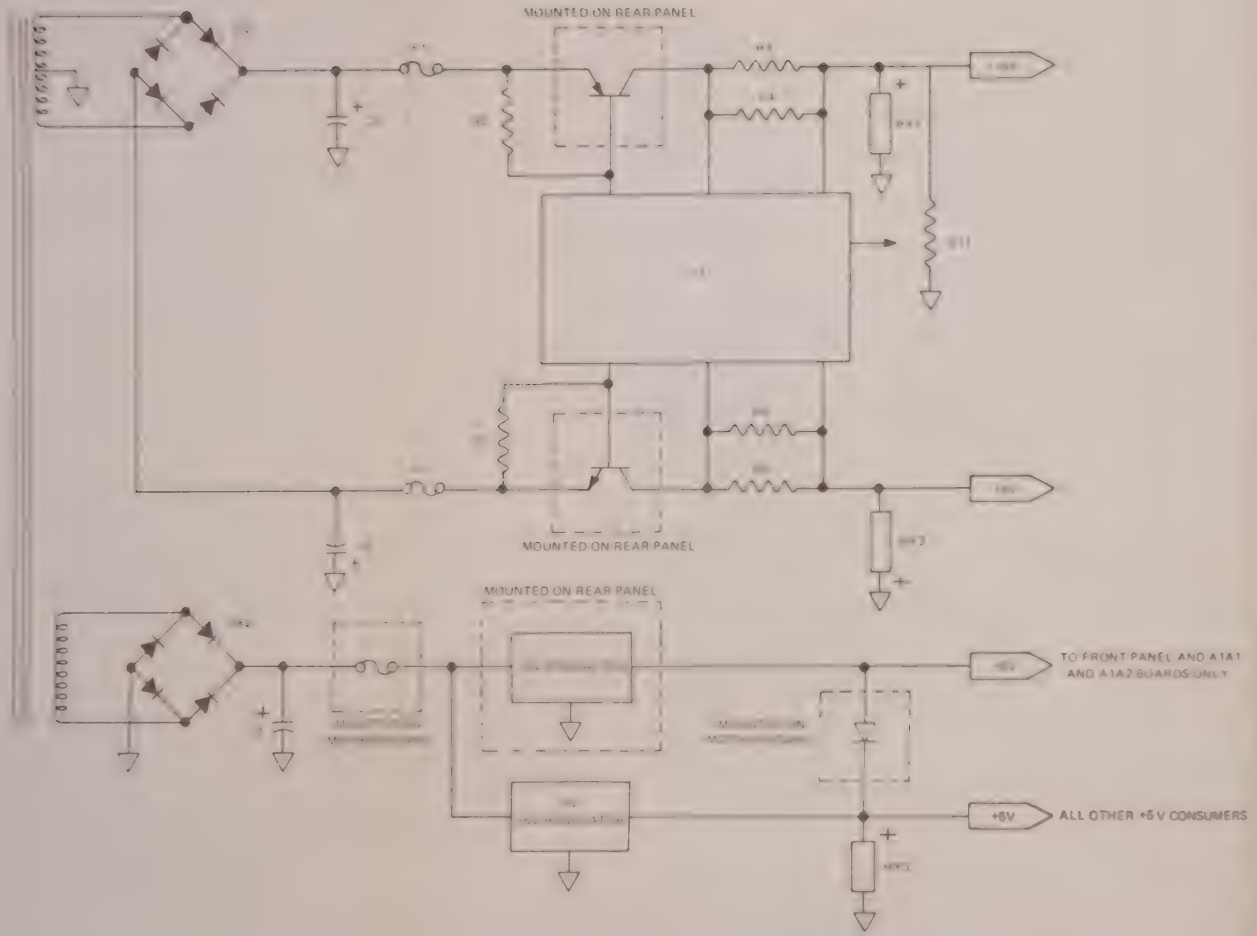
The Lamp Logic PWB Assembly contains the front panel backlighting lamps and their drivers to indicate mode selection, logic to select the manual or auto mode of operation, and clocked flip-flops (U4) to operate the sweep and recorder.

When the MANUAL mode is selected, U2–P4 is a logic "1" and U2–P3 is a "0", which enables U4A and disables U4B. U4A can then operate as a clocked flip-flop to alternately raise and lower the pen on the recorder when the RECORD switch is operated. When the AUTO mode is selected, the logic states are reversed to disable U4A and enable U4B. The RECORD switch will lower the pen as before and will now generate a sweep on command. Operation of the RECORD switch again will raise the pen and reset the sweep. If the RECORD switch is not operated, the sweep will automatically reset with a sweep reset command from the Sweep Generator and Mode Logic PWB.

The R31C3 network is a switch contact debouncer of .15 sec (± 50%) duration. The R32C2 network causes the 4620 to power up condition, the R28C1 network causes the R28C1 and R32C2 networks cause the Model 4670 to power up in the manual mode with recorder pen up.

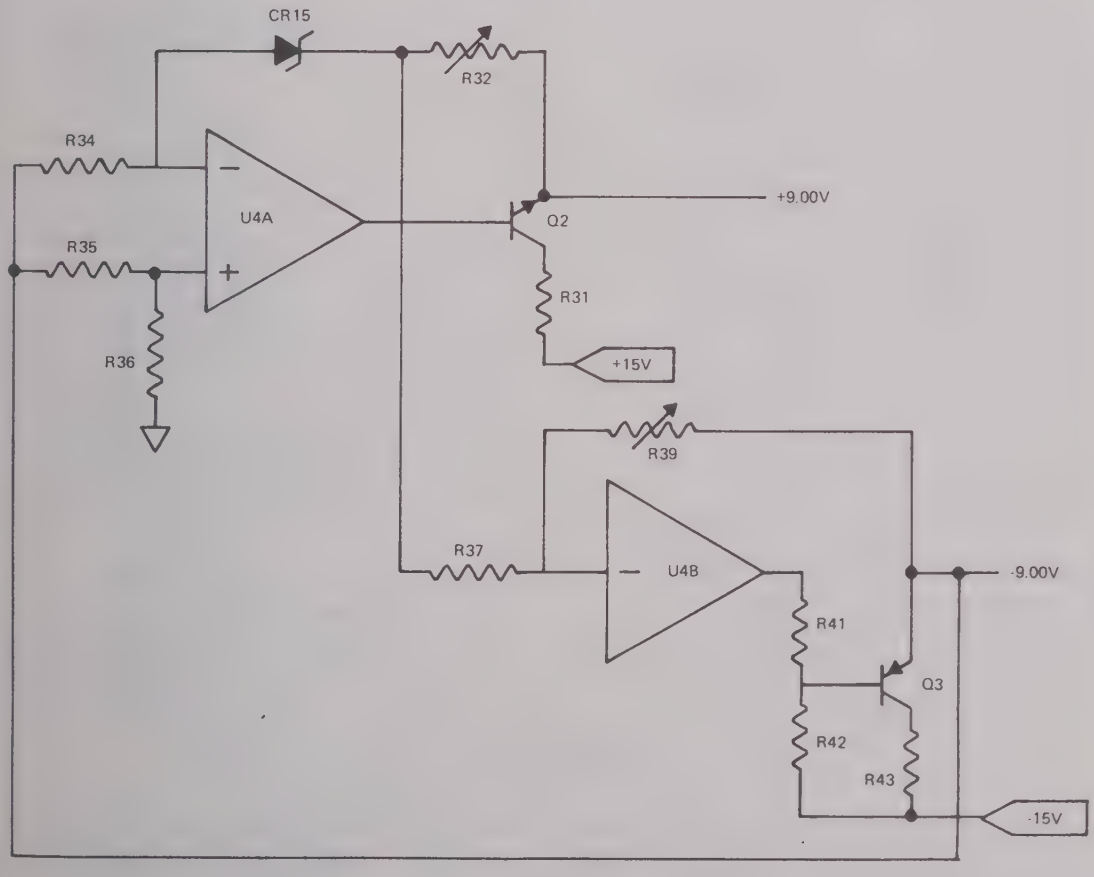



Display Interface Assembly Timing Diagram.


MOUNTED ON REAR PANEL
MOUNTED ON REAR PANEL
MOUNTED ON REAR PANEL
TO FRONT PANEL AND A1A1 AND A1A2 BOARDS ONLY
+5V
ALL OTHER +5 V CONSUMERS

### 4.3.2.22 ±9 VOLT POWER SUPPLY

The ±9 volt precision voltage regulators provide stable reference sources for critical sweep timing and integration circuits. Zener, CR15, is a temperature compensated 9.0 volt zener diode which is connected in the feedback loop around U4A. As long as the current through the zener is held close to the optimum value of 7.5 mA, the zener voltage will be practically insensitive to temperature changes. R35 and R36 form a voltage divider to place the non-inverting input of U4A at −.5V. This action places the junction of CR15 and R32 at nominally +8.5V which allows R32 to be adjusted over the full tolerance range of CR15 to yield +9.00 volts at the emitter of Q2. R37 is also connected to the anode of CR15 and uses that voltage as the reference for the −9V supply. U4B is a unity gain inverting amplifier. R41 and R42 insure that Q3 is always biased on even if the output of U4B should go to +15V. This circuit is necessary to insure that CR15 is not forward biased. R31 and R43 limit the current available from this supply to approximately 20 mA.




±9 VOLT POWER SUPPLY

# CHAPTER 5
# MAINTENANCE

## 5.1 GENERAL

This chapter contains the information necessary to verify performance and to locate and repair subassemblies not performing to specifications. Before attempting to repair the equipment, the theory of operation, Chapter 4, should be reviewed.

## 5.2 PERFORMANCE VERIFICATION

### 5.2.1 MODEL 4670 PERFORMANCE VERIFICATION

#### 5.2.1.1 FREQUENCY ACCURACY

The purpose of this test is to ensure that the digital FREQUENCY - kHz display indicates the correct input frequency when the Model 4670-1 is tuned for maximum signal-level indication.

**Specification:**

±15 kHz in modes using wideband filter
±1 kHz in modes using narrowband filter

**Recommended Test Equipment:**

| | |
|---|---|
| Level Generator | W & G AT610 |
| Signal Generator | HP 8640B |
| 50/75 ohm Min-Loss Pad | Wavetek M157 |

**Test Procedure:**

a. Adjust the Model AT610 for an output of 1 MHz ±50 Hz, -20 dBm. Connect the output to the IF/BB input of the Model 4670-1.

b. Adjust the controls of the Model 4670-1 as follows:

| | |
|---|---|
| INPUT | -20 dBm |
| REFERENCE | 0 dB |
| BB | NPR |
| MODE | MANUAL |

c. Adjust the Model 4670-1 TUNING for maximum signal level indication. The FREQUENCY - kHz display should read 1000 ±1 kHz.

d. Select BB RESPONSE mode.

e. Adjust the Model 4670-1 TUNING for maximum signal level indication. The FREQUENCY - kHz display should read 1000 ±15 kHz.

f. Adjust the Model 8640B for an output of 70 MHz ±1 kHz at a level of -14 dBm. Connect the output through a 50/75 ohm min-loss pad to the IF/BB input of the Model 4670-1.

g. Adjust the controls of the Model 4670-1 as follows:

| | |
|---|---|
| INPUT | -20 dBm |
| REFERENCE | 0 dB |
| IF | ±35 MHz |
| MODE | MANUAL |

h. Adjust the Model 4670-1 TUNING for maximum signal level indication. The FREQUENCY - kHz display should read 70000 ±15 kHz.

#### 5.2.1.2 SENSITIVITY

The purpose of this test is to verify that the noise level and any internally generated extraneous signals are below -120 dBm for the narrowband modes and -105 dBm for the

wideband modes. This test is performed the easiest by scanning in the AUTO mode and recording the residual noise level on the Model 4673 X-Y Plotter.

**Specification:**

| | |
|---|---|
| Narrowband Filter | |
| 1.74 kHz | -120 dBm |
| Wideband Filter | |
| 30 kHz | -105 dBm |

**Recommended Test Equipment:**

75 ohm termination

**Test Procedure:**

a. Connect the Model 4670-1 to the Model 4673 X-Y Plotter and adjust the X and Y ZERO controls for Tone Search calibration. Use the chart paper calibrated for NPR and Tone Search.

b. Connect a 75 ohm termination to the IF/BB input jack.

c. Adjust the controls of the Model 4670-1 as follows:

| | |
|---|---|
| INPUT | -20 dBm |
| REFERENCE | -40 dB |
| BB | TONE SEARCH |
| MODE | AUTO |

d. Press the RECORD switch. The residual noise level should be recorded directly by the X-Y Plotter on the calibrated chart paper. The noise level and spurious responses, if any, should be less than -120 dBm.

e. The Model 4670-1 may be operated in the manual mode by pressing the MANUAL switch. The noise level as displayed on the digital LEVEL meter should be less than -120 dBm for frequencies between 60 kHz and 12 MHz. Any spurious responses observed in step "d" above may be tuned to and the level checked on the LEVEL meter.

f. Place the Model 4670-1 in the IF mode by pressing the ±35 MHz switch.

g. Press the AUTO switch and then the RECORD switch. The residual noise level and spurious responses, if any, should be less than -105 dBm.

h. The Model 4670-1 may be operated in the manual mode while recording the residual noise level and searching for spurious responses. The noise level as displayed on the digital LEVEL meter should be less than -105 dBm.

### 5.2.1.3 FREQUENCY RESPONSE VARIATION

The purpose of this test is to verify that the frequency response variation is less than ±0.2 dB in the baseband mode and less than ±0.5 dB in the IF mode.

**Specification:**

| | |
|---|---|
| 60 kHz - 12 MHz | ±0.2 dB |
| 35 MHz - 105 MHz | ±0.5 dB |

**Recommended Test Equipment:**

| | |
|---|---|
| Level Generator | W & G AT610 |
| Signal Generator | HP 8640B |
| 50/75 ohm Min-Loss Pad | Wavetek M157 |
| Milliwatt Test Set | W & G EPM-1 |

**Test Procedure:**

a. Set the AT610 generator output for a level of -20 dBm and connect it through a short cable to the IF/BB input of the Model 4670-1.

b. Adjust the controls on the Model 4670-1 as follows:

| | |
|---|---|
| INPUT | -20 dBm |
| REFERENCE | 0 dB |
| BB | RESPONSE |
| MODE | MANUAL |

BASEBAND FREQUENCY
RESPONSE TESTS

| FREQUENCY | SIGNAL LEVEL dBm |
|---|---|
| 60 KHz | |
| 100 KHz | |
| 200 KHz | |
| 500 KHz | |
| 1 MHz | |
| 2 MHz | |
| 3 MHz | |
| 4 MHz | |
| 5 MHz | |
| 6 MHz | |
| 7 MHz | |
| 8 MHz | |
| 9 MHz | |
| 10 MHz | |
| 11 MHz | |
| 12 MHz | |

## IF RESPONSE TESTS

| FREQUENCY MHz | SIGNAL LEVEL dBm |
|---|---|
| 35.000 | |
| 40.000 | |
| 50.000 | |
| 60.000 | |
| 70.000 | |
| 80.000 | |
| 90.000 | |
| 100.000 | |
| 105.000 | |

c. Set the AT610 to each frequency listed in the table below and simultaneously tune the Model 4670-1 to the same frequency as indicated by the FREQUENCY display. Record the digital LEVEL display reading for each frequency.

d. The maximum variation in level readings in step "c" should be equal to or less than 0.4 dB plus one bit resolution, or 0.5 dB. If the data is manually recorded on the 4673 X-Y Plotter, the peak-to-peak variation should be 0.4 dB or less.

e. Place the 4670-1 in the IF mode by pressing the ±35 Mhz switch. Set the INPUT controls to 0 dBm.

f. Connect the 8640B Signal Generator through a 50/75 ohm pad to the EPM-1 Milliwatt Test Set. Adjust the 8640B for 35.000 MHz CW. Adjust the output level for 0 dBm as read on the EPM-1.

g. Disconnect the EPM-1 and, with the same cable and 50/75 ohm pad, connect the 8640B to the IF/BB input of the 4670-1.

h. Adjust the frequency of the 4670-1 to 35000 kHz and record the digital LEVEL - dBm reading.

i. Repeat steps "e" through "h" for each frequency listed in the table below.

j. The peak-to-peak variation in the signal levels recorded should be 1.0 dB or less.

### 5.2.1.4 SIGNAL AMPLITUDE MEASUREMENT ACCURACY

The purpose of this test is to verify the level measurement accuracy of the Model 4670-1. This test measures the accuracy at a single frequency and level. The accuracy over the complete range of the Model 4670-1 will be a composite of the absolute accuracy measured in this test plus the relative attenuator accuracy and the frequency response variation measured in separate tests.

**Specification:**

0.5 dB maximum for a -20 dBm signal input at 1 MHz in the Baseband Mode and at 70 MHz in the IF mode.

**Recommended Test Equipment:**

| | |
|---|---|
| Level Generator | W & G AT610 |
| Signal Generator | HP 8640B |
| 50/75 ohm Min-Loss Pad | Wavetek M157 |
| Milliwatt Test Set | W & G EPM-1 |

**Test Procedure:**

a. Set the AT610 generator for an output of -20 dBm, 1000 kHz. Connect it to the IF/BB input of the 4670-1 through a short 75 ohm patch cable.

b. Adjust the controls on the Model 4670-1 as follows:

| | |
|---|---|
| INPUT | -20 dBm |
| REFERENCE | 0 dB |
| BB | RESPONSE |
| MODE | MANUAL |

c. Tune the Model 4670-1 for a frequency of 1000 kHz.

d. Record the digital LEVEL dBm display reading. The level should read -20.0 ±0.5 dBm.

e. Place the Model 4670-1 in the IF mode by pushing the ±5 MHz switch.

f. Set the INPUT controls on the Model 4670-1 to 0 dBm.

g. Connect the 8640B Signal Generator through a 50/75 ohm pad and 75 ohm cable to the EPM-1 Milliwatt Test Set. Adjust the 8640B for 70.000 MHz and adjust the output level for 0 dBm as read on the EPM-1.

h. Disconnect the EPM-1, and using the same 50/75 ohm pad and cable connect the 8640B to the IF/BB input of the Model 4670-1.

i. Tune the Model 4670-1 to 70000 kHz.

j. Record the digital LEVEL dBm display reading. The level should read 0 ±0.5 dBm.

### 5.2.1.5 ATTENUATOR ACCURACY

The purpose of this test is to verify the accuracy of the INPUT and REFERENCE attenuator and gain controls. The INPUT attenuator is at the input of the Model 4670-1 and operates at baseband and IF frequencies. The frequency response variation for this attenuator is included in the variation measured in a separate test. The attenuator accuracy is measured in this test at a single frequency (5 MHz). The REFERENCE gain controls operate at the 30 kHz internal intermediate frequency of the 4670-1 and, therefore do not contribute to the frequency response variation for the baseband or IF inputs.

**Specification:**

| | |
|---|---|
| ±0.3 dB | For each 10 dB step |
| ±0.1 dB | For each 1 dB step |

**Recommended Test Equipment:**

| | |
|---|---|
| Level Generator | W & G AT610 |

**Test Procedure:**

a. Connect the AT610 to the IF/BB input of the Model 4670-1 through a 75 ohm patch cable.

b. Adjust the controls on the Model 4670-4670-1 as follows:

| | |
|---|---|
| INPUT | 0 dBm |
| REFERENCE | 0 dB |
| BB | RESPONSE |
| MODE | MANUAL |

c. Tune the Model 4670-1 to 5000 kHz.

d. Set the frequency of the AT610 to 5.000 MHz.

e. Set the AT610 level control to 0 dBm and adjust the vernier level control for a reading of 0.0 dBm on the Model 4670 LEVEL display.

f. Set the AT610 attenuator for +6 dBm. Do not change the vernier setting until step "i".

g. Set the Model 4670-1 INPUT controls to +10 and -4 and record the digital LEVEL display reading.

h. Repeat steps "f" and "g" for the even value control settings listed in the following table.

i. Change the vernier setting on the AT610 to reduce the output power 1.0 dB.

j. Record the digital LEVEL display reading for the odd value control settings listed in the following table.

k. Note the difference in the measured signal level and the generator output level. Compare the difference with the above specification.

### 5.2.1.6 RETURN LOSS

The purpose of this test is to verify the accuracy of the 75 ohm input network for the IF/BB input for the baseband and IF range. The return loss is checked for various settings of the INPUT attenuator controls.

**Specification:**

| | |
|---|---|
| 60 kHz to 12 MHz | 26 dBm min |
| 35 MHz to 105 MHz | 26 dBm min |

**Recommended Test Equipment:**

| | |
|---|---|
| Level Generator | W & G AT610 |
| Selective Levelmeter | W & G AT611 |
| Return Loss Bridge (75 ohm) | W & G RFZ-5 |
| Microwave Link Analyzer | HP 3702/ 3710 Series |

## ATTENUATOR ACCURACY TESTS

| INPUT LEVEL dBm | INPUT CONTROLS | | REFERENCE CONTROLS | | MEASURED LEVEL dBm |
|---|---|---|---|---|---|
| | 10 dB Step | 1 dB Step | 10 dB Step | 1 dB Step | |
| +6 | +10 | -4 | 0 | 0 | |
| +5 | +10 | -5 | 0 | 0 | |
| +4 | +10 | -6 | 0 | 0 | |
| +3 | +10 | -7 | 0 | 0 | |
| +2 | +10 | -8 | 0 | 0 | |
| +1 | +10 | -9 | 0 | 0 | |
| 0 | 0 | 0 | 0 | 0 | |
| -10 | -10 | 0 | 0 | 0 | |
| -20 | -10 | -10 | 0 | 0 | |
| -21 | -10 | -10 | 0 | -1 | |
| -22 | -10 | -10 | 0 | -2 | |
| -23 | -10 | -10 | 0 | -3 | |
| -24 | -10 | -10 | 0 | -4 | |
| -25 | -10 | -10 | 0 | -5 | |
| -26 | -10 | -10 | 0 | -6 | |
| -27 | -10 | -10 | 0 | -7 | |
| -28 | -10 | -10 | 0 | -8 | |
| -29 | -10 | -10 | 0 | -9 | |
| -30 | -10 | -10 | 0 | -10 | |
| -40 | -10 | -10 | -10 | -10 | |
| -50 | -10 | -10 | -20 | -10 | |
| -60 | -10 | -10 | -30 | -10 | |

**Test Procedure - Baseband:**

a. Connect the ~~AT610/~~611 to the return loss bridge.

b. Set the input of the AT611 for 75 ohms and the AT610 for tracking operation.

c. Set the controls of the Model 4670-1 as follows:

| | |
|---|---|
| INPUT | -20 dBm |
| REFERENCE | 0 dB |
| BB | RESPONSE |
| MODE | MANUAL |

(The Model 4670-1 does not have to be tuned to the frequency of the AT610/611 for this test: the return loss will vary only slightly as the Model 4670-1 is tuned. However, for consistency in recording data, tune the Model 4670-1 to the AT610/611 frequency.)

d. Adjust the frequency of the AT610/611 to 1.000 MHz and adjust the level for a reference reading on a short or open circuit at the return loss bridge test port. Do not exceed -20 dBm power output from the AT610 to prevent overloading the Model 4670-1 for any position of the INPUT attenuators.

e. Connect the test port of the return loss bridge to the IF/BB input of the Model 4670-1 through a precision 75 ohm cable directly through a WECO adaptor.

f. Record the output of the return loss bridge as measured by the AT611. The return loss of the Model 4670-1 is this reading subtracted from the reference reading taken in step "d".

g. Adjust the Model 4670-1 INPUT attenuator to -15 dBm and repeat step "f".

h. Adjust the INPUT attenuator to -10 dBm and repeat step "f".

i. Adjust the frequency of the AT610/611 to the frequencies listed in the table below and repeat steps "d" through "h". The return loss for all tests should be greater than 26 dB.

**Test Procedure - IF:**

a. Connect the HP 3702/3710 Series Microwave Link Analyzer to the Hewlett-Packard return loss bridge.

b. Set the controls of the Model 4670-1 as follows:

| | |
|---|---|
| INPUT | -10 dBm |
| REFERENCE | 0 dB |
| IF | ±35 MHz |
| MODE | MANUAL |

(It is not necessary to tune the Model 4670-1 to the frequency of the 3702/3710, but as a check that the system is working properly, it is suggested that the Model 4670-1 be tuned to the input frequency.)

c. Adjust the frequency of the 3702/3710 to ~~45~~ MHz and set up the MLA receiver for return loss operation. Obtain a reference reading with the calibrated mismatch normally furnished with the MLA.

d. Connect the test port of the return loss bridge to the IF/BB input of the Model 4670-1 through a precision 75 ohm cable or directly through a WECO adaptor.

e. Record the return loss measured by the 3702/3710.

f. Adjust the Model 4670-1 INPUT attenuator controls to -5 dBm and repeat step "e".

g. Adjust the INPUT attenuator to 0 dBm and repeat step "e".

h. Adjust the frequency of the 3702/3710 to the frequencies listed in the table below and repeat step "c" through "g". The measured return loss for all frequencies should be greater than 26 dB.

### 5.2.1.7 DEEMPHASIS NETWORK

The purpose of this test is to determine that the loss of the deemphasis network corresponds to that of the Western Electric 4208B specification. The loss measured is the combined loss of the Model 4670-1 124/75 ohm transformer and 75 ohm deemphasis network.

The procedure below measures the loss in a 75 ohm unbalanced system by utilizing a resistor network on the 124 ohm side of the 124/75 ohm transformer. This technique allows the measurement system to be calibrated in a back-to-back or straight-through test in a 75 ohm system, and avoids using an external 124/75 ohm transformer and correcting for the loss of that transformer. The loss is measured at the test ports of the Model 4670-1 and does not include loss of external cables.

**Specification:**

| Frequency (MHz) | Loss (dB) |
|---|---|
| 0.1 | .12 |
| 0.5 | .52 |
| 1.0 | 1.49 |
| 2.0 | 3.94 |
| 3.0 | 6.07 |
| 4.0 | 7.72 |
| 5.0 | 8.96 |
| 6.0 | 9.91 |
| 7.0 | 10.64 |
| 8.0 | 11.20 |
| 9.0 | 11.65 |
| 10.0 | 12.02 |

The Western Electric manufacturing tolerance is ±.03 dB.

**Recommended Test Equipment:**

| | |
|---|---|
| Level Generator | W & G AT610 |
| Selective Levelmeter | W & G AT611 |
| 124/75 ohm Test Fixture | See Diagram |

**Test Procedure:**

The demephasis network is a passive network. The tests below may be conducted with the Model 4670-1 power off.

a. Connect a looping plug from the deemphasis network input to the 75 ohm side of the 124/75 ohm transformer.

b. Set the AT610/611 to 0.1 MHz. Connect 75 ohm cables to the AT610 and AT611. Connect the two cables together through an adaptor and adjust the AT610 level vernier control for a straight-through 0 dB reference reading.

c. Connect the trompeter jacks of the test fixture to the 124 ohm input jacks of the Model 4670-1 with P2 connected to the input jack on the left side.

d. Connect the output cable from the AT610 to P1 of the 124/75 ohm test fixture.

e. Connect the 75 ohm cable from the AT611 input to the deemphasis network output.

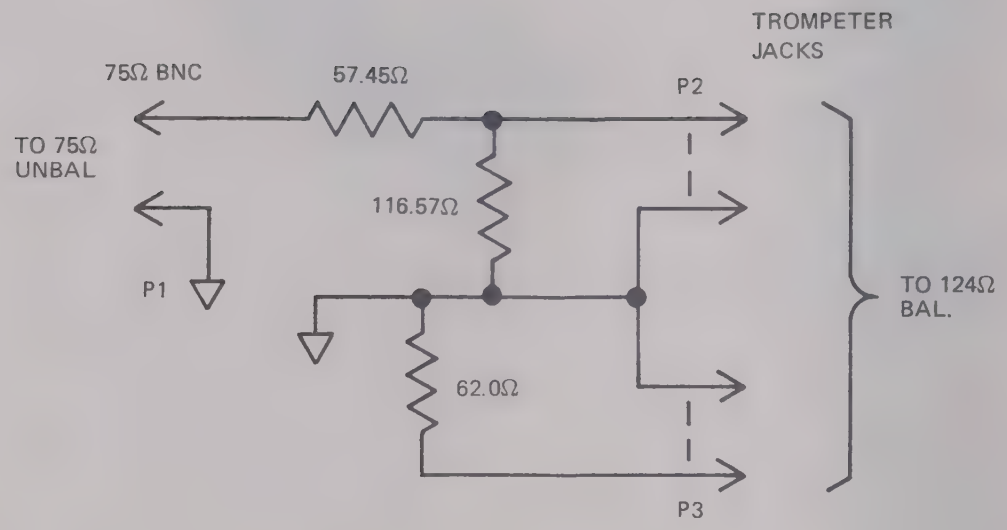
f. Record as L1 the insertion loss measured by the AT610/611 test set. Measure to the nearest .01 dB or better.

g. Turn the test fixture over so that P3 is connected to the input jack on the left side.

h. Record as L2 the insertion loss measured by the AT610/611 test set. Measure to the nearest .01 dB or better.

i. Repeat steps "b" through "h" above for the remaining specified frequencies.

j. Determine the deemphasis network insertion loss. The insertion loss is the average of the loss measured in steps "f" and "h" minus the loss introduced by the 124/75 ohm test fixture, which is theoretically 6.593 dB. Compute (L1 + L2)/2, round off to the nearest .01 dB, and subtract 6.59 dB.




MATCHING LOSS 6.593 dB

## DEEMPHASIS NETWORK LOSS TESTS

| FREQUENCY (MHz) | L 1 (Step f) | L 2 (Step h) | $\frac{L1 + L2}{2}$ | INSERTION LOSS |
|---|---|---|---|---|
| 0.1 | | | | |
| 0.5 | | | | |
| 1.0 | | | | |
| 2.0 | | | | |
| 3.0 | | | | |
| 4.0 | | | | |
| 5.0 | | | | |
| 6.0 | | | | |
| 7.0 | | | | |
| 8.0 | | | | |
| 9.0 | | | | |
| 10.0 | | | | |

## 5.2.2 MODEL 4660 PERFORMANCE VERIFICATION

### 5.2.2.1 OUTPUT POWER

The purpose of this test is to ensure that the output power of the noise generator is 0 ±.25 dBm when the ATTENUATION controls are set to zero. This test also checks that the automatic level control maintains the output power constant within 0.1 dB as the bandstop filters are switched in and out.

**Specification:**

| | |
|---|---|
| Output Power | 0 ±.25 dBm |
| Power change with bandstop filters in or out | 0.1 dB max |

**Recommended Test Equipment:**

Milliwatt Test Set W & G EPM-1

**Test Procedure:**

a. Connect the power head of the EPM-1 Milliwatt Test Set directly to the XMTR OUT jack of the Model 4660-1 through a WECO adaptor.

b. Set the ATTENUATION controls on the Model 4660-1 to zero and select the BB RESPONSE mode.

c. Record, in the table below, the power level measured by the EPM-1 for the baseband response mode. The power measured should be 0 dBm ±0.25 dB maximum.

d. Select the channel loadings listed in the table below. For each channel loading record the output power measured with Slots In and Slots Out. The power should be within 0 ±.25 dBm. The change in power with Slots In and Slots Out should be less than 0.1 dB.

### 5.2.2.2 OUTPUT FLATNESS

This test measures the flatness of the noise power spectrum in the BB RESPONSE mode.

**Specification:**

| | |
|---|---|
| 316 kHz - 9.5 MHz* | 0.5 dB max variation in average power measured in a 1.74 kHz bandwidth. |

**Recommended Test Equipment:**

Selective Levelmeter ~~W & G AT610~~

**Test Procedure:**

a. Set the Model 4660-1 ATTENUATION controls to zero and select BB RESPONSE mode.

b. Connect the XMTR OUT jack to the 75 ohm input of the AT611.

c. Select 1.74 kHz bandwidth and slow meter response for the AT611.

d. Tune the selective levelmeter to each frequency listed in the table on the following page and record the measured noise power level. The maximum difference in measured levels should be 0.5 dB or less (excluding the 316 kHz level since the power is attenuated by the 316 kHz high-pass filter).

* Upper limit changed from 10 MHz to 9.5 MHz to be consistent with the low pass filter specified in paragraph 3.19 for baseband response tests.

### 5.2.2.3 ATTENUATOR ACCURACY

The purpose of this test is to verify the accuracy of the output attenuator. The attenuator accuracy could be measured by measuring the output noise power as a function of attenuator setting. However, because of the difficulty

## OUTPUT FLATNESS TESTS

| Frequency | Output Level |
|---|---|
| 316 KHz | |
| 400 KHz | |
| 600 KHz | |
| 1 MHz | |
| 2 MHz | |
| 3 MHz | |
| 4 MHz | |
| 5 MHz | |
| 6 MHz | |
| 7 MHz | |
| 8 MHz | |
| 9 MHz | |
| 9.5 MHz | |

in resolving the power level to the desired accuracy because of the noise fluctuation, the attenuator is disconnected and measured separately.

**Specification:**

| | |
|---|---|
| Each 1 dB Step | ±0.1 dB max |
| Each 10 dB Step | ±0.1 dB max |
| Maximum cumulative error for up to ten 1 dB steps | ±0.3 dB |

**Recommended Test Equipment:**

| | |
|---|---|
| Level Generator | W & G AT610 |
| Selective Levelmeter | W & G AT611 |

**Test Procedure:**

a. Remove the top cover from the Model 4660-1. Disconnect the attenuator input cable W12 from the ALC unit and connect it to the output of the AT610.

b. Connect the AT611 to the front panel XMTR OUT jack.

c. Set the frequency of the AT610/611 to 1 MHz.

d. Vary the ATTENUATION controls from 0 dB to 9 dB in 1 dB steps and 10 dB to 40 dB in 10 dB steps. Record the measured attenuation and check the measured attenuation against the above specifications.

e. Set the AT610/611 to 5 MHz and repeat step "d".

f. Set the AT610/611 to 10 MHz and repeat step "d".

### 5.2.2.4 RETURN LOSS

The purpose of this test is to verify the accuracy of the 75 ohm output attenuator and driving source. The output return loss is measured as a function of ATTENUATION settings.

**Specification:**

Return loss greater than 26 dB with notch filters out.

**Recommended Test Equipment:**

| | |
|---|---|
| Level Generator | W & G AT610 |
| Selective Levelmeter | W & G AT611 |
| Return Loss Bridge (75 ohm) | W & G RFZ-5 |

**Test Procedure:**

a. Connect the AT610/611 to the return loss bridge.

b. Set the input of the AT611 for 75 ohms and the AT610 for tracking operation.

c. Select TONE SEARCH (Noise Off) mode. Set the ATTENUATION controls to zero.

d. Adjust the frequency of the AT610/611 to 1.000 MHz and adjust the level for a reference reading on a short or open circuit at the return loss bridge test port.

e. Connect the test port of the return loss bridge to the XMTR OUT jack of the Model 4660-1 through a precision 75 ohm cable or directly through a WECO adaptor.

f. Record the output of the return-loss bridge as measured by the AT611. The return loss of the Model 4660-1 is this reading subtracted from the reference reading taken in step "d".

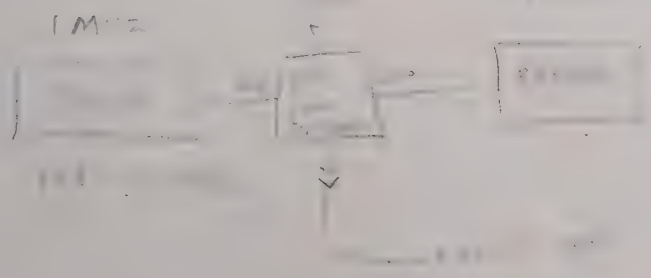
g. Repeat step "f" for the ATTENUATION settings listed in the table below.

h. Adjust the frequency of the AT610/611 to 12 MHz and repeat steps "d" through "g". The return loss measured should be greater than 26 dB in all cases.

## RETURN LOSS TESTS

FREQUENCY: 1 MHz ON 4620 TRANS ON 3586B LEVEL MEAS

| INPUT ATTENUATOR | | REFERENCE LEVEL (Step d) | REFLECTED LEVEL (Step f) | RETURN LOSS |
|---|---|---|---|---|
| 0 | 0 | | | |
| 0 | 1 | | | |
| 0 | 2 | | | |
| 0 | 3 | | | |
| 0 | 4 | | | |
| 0 | 5 | | | |
| 0 | 6 | | | |
| 0 | 7 | | | |
| 0 | 8 | | | |
| 0 | 9 | | | |
| 10 | 0 | | | |
| 20 | 0 | | | |
| 30 | 0 | | | |
| 40 | 0 | | | |



## RETURN LOSS TESTS

| FREQUENCY: 12 MHz | | | | |
|---|---|---|---|---|
| INPUT ATTENUATOR | | REFERENCE LEVEL (Step d) | REFLECTED LEVEL (Step f) | RETURN LOSS |
| 0 | 0 | | | |
| 0 | 1 | | | |
| 0 | 2 | | | |
| 0 | 3 | | | |
| 0 | 4 | | | |
| 0 | 5 | | | |
| 0 | 6 | | | |
| 0 | 7 | | | |
| 0 | 8 | | | |
| 0 | 9 | | | |
| 10 | 0 | | | |
| 20 | 0 | | | |
| 30 | 0 | | | |
| 40 | 0 | | | |

### 5.2.2.5 PREEMPHASIS NETWORK

The purpose of this test is to determine that the loss of the preemphasis network corresponds to that of the Western Electric 4208A specification. The preemphasis network includes a 124/75 ohm transformer.

The procedure below measures the loss in a 75 ohm unbalanced system by utilizing a resistor network on the 124 ohm side of the 124/75 ohm transformer. This technique allows the measurement system to be calibrated in a back-to-back or straight-through test in a 75 ohm system, and avoids using an external 124/75 ohm transformer and correcting for the loss of that transformer. The loss is measured at the test ports of the Model 4660-1 and does not include loss of external cables.

**Specification:**

| Frequency (MHz) | Loss (db) |
|---|---|
| 0.1 | 14.00 |
| 0.5 | 13.61 |
| 1.0 | 12.61 |
| 2.0 | 10.18 |
| 3.0 | 8.06 |
| 4.0 | 6.43 |
| 5.0 | 5.19 |
| 6.0 | 4.25 |
| 7.0 | 3.52 |
| 8.0 | 2.96 |
| 9.0 | 2.52 |
| 10.0 | 2.17 |

The Western Electric manufacturing tolerance is ±.03 dB.

**Recommended Test Equipment:**

| | |
|---|---|
| Level Generator | W & G AT610 |
| Selective Levelmeter | W & G AT611 |
| 124/75 Ohm Test Fixture | See Diagram |

**Test Procedures:**

The preemphasis network is a passive network. The tests below may be conducted with the Model 4660-1 power off.

a. Set the AT610/611 to 0.1 MHz. Connect 75 ohm cables to the AT610 and AT611. Connect the two cables together through an adaptor and adjust the AT610 level vernier control for a straight-through 0 dB reference reading.

b. Connect the trompeter jacks of the test fixture to the 124 ohm input jacks of the Model 4660-1 with P2 connected to the output jack on the left side.

c. Connect the output cable from the AT610 to the 75 ohm input to the preemphasis network.

d. Connect the 75 ohm cable from the AT611 input to the output (P1) of the test fixture.

e. Record as L1 the insertion loss measured by the AT610/611 test set. Measure to the nearest .01 dB or better.

f. Turn the test fixture over so that P3 is connected to the output jack on the left side.

g. Record as L2 the insertion loss measured by the AT610/611 test set. Measure to the nearest .01 dB or better.

h. Repeat steps "a" through "g" above for the remaining frequencies listed in the table below.

i. Determine the preemphasis network loss. The insertion loss is the average of the loss measured in steps "e" and "g" minus the loss introduced by the 124/75 ohm test fixture, which is theoretically 6.593 dB. Compute (L1 + L2)/2, round off to the nearest .01 dB and subtract 6.59 dB.

PREEMPHASIS NETWORK LOSS TESTS

| FREQUENCY (MHz) | L 1 (Step e) | L 2 (Step g) | $\frac{L1 + L2}{2}$ | INSERTION LOSS |
|---|---|---|---|---|
| 0.1 | | | | |
| 0.5 | | | | |
| 1.0 | | | | |
| 2.0 | | | | |
| 3.0 | | | | |
| 4.0 | | | | |
| 5.0 | | | | |
| 6.0 | | | | |
| 7.0 | | | | |
| 8.0 | | | | |
| 9.0 | | | | |
| 10.0 | | | | |

# CHAPTER 6
# PARTS LISTS

## 6.1 GENERAL

The parts lists for this unit are included in this chapter. Special modifications, if any, are described at the front of this manual.

## 6.2 EXPLANATION OF COLUMN HEADINGS

### REF. DESIG.

This column contains the assigned reference designation. The reference designation appears on the reference figure.

### DESCRIPTION

A brief electrical and/or mechanical description of the component is contained in this column. Abbreviations used are given at the end of this chapter.

### SCIENTIFIC-ATLANTA PART NO.

The Scientific-Atlanta part number is listed in this column.

## 6.3 ORDERING PARTS

When ordering parts from Scientific-Atlanta, always include the Scientific-Atlanta part number, the part description, the unit serial number, unit name, and subassembly name.

## 6.4 PARTS SUBSTITUTION

Common components may differ from those shown in the parts list. This difference is due to the substitution of a more current part during assembly. In such cases, the type shown in the parts list or the type removed may be used as a replacement.

MODEL 4660
BASEBAND NOISE TRANSMITTER

BASEBAND NOISE XMTR MODEL 4660-1

REF DESIG PREFIX A01

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| A01 | 146292 | PWB ASSY-ATTENUATOR 0-49 DB | | |
| A02 | 147596 | CHASSIS ASSY-BB NOISE XMTR, MODEL 4660-1 | | |
| A03 | 147791 | REAR PANEL ASSY | | |

PWR ASSY-ATTENUATOR 0-49 DB

REF DESIG PREFIX A1A1

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| R01 | 83099 | RESISTOR 1.30K OHM RN55C 1% MTL FLM | | RN55C1301F |
| R02 | 83082 | RESISTOR 17.4 OHM RN55C 1% MTL FLM | | RN55C17R4F |
| R03 | 83082 | RESISTOR 17.4 OHM RN55C 1% MTL FLM | | RN55C17R4F |
| R04 | 83099 | RESISTOR 1.30K OHM RN55C 1% MTL FLM | | RN55C1301F |
| R05 | 83098 | RESISTOR 649 OHM RN55C 1% MTL FLM | | RN55C6490F |
| R06 | 83082 | RESISTOR 17.4 OHM RN55C 1% MTL FLM | | RN55C17R4F |
| R07 | 83098 | RESISTOR 649 OHM RN55C 1% MTL FLM | | RN55C6490F |
| R08 | 78914 | RESISTOR 442 OHM RN55C 1% MTL FLM | | RN55C4420F |
| R09 | 83083 | RESISTOR 26.7 OHM RN55C 1% MTL FLM | | RN55C26R7F |
| R10 | 78914 | RESISTOR 442 OHM RN55C 1% MTL FLM | | RN55C4420F |
| R11 | 83097 | RESISTOR 332 OHM RN55C 1% MTL FLM | | RN55C3320F |
| R12 | 83084 | RESISTOR 35.7 OHM RN55C 1% MTL FLM | | RN55C35R7F |
| R13 | 83097 | RESISTOR 332 OHM RN55C 1% MTL FLM | | RN55C3320F |
| R14 | 83096 | RESISTOR 267 OHM RN55C 1% MTL FLM | | RN55C2670F |
| R15 | 83085 | RESISTOR 45.3 OHM RN55C 1% MTL FLM | | RN55C45R3F |
| R16 | 83096 | RESISTOR 267 OHM RN55C 1% MTL FLM | | RN55C2670F |
| R17 | 83095 | RESISTOR 226 OHM RN55C 1% MTL FLM | | RN55C2260F |
| R18 | 83086 | RESISTOR 56.2 OHM RN55C 1% MTL FLM | | RN55C56R2F |
| R19 | 83095 | RESISTOR 226 OHM RN55C 1% MTL FLM | | RN55C2260F |
| R20 | 78912 | RESISTOR 196 OHM RN55C 1% MTL FLM | | RN55C1960F |
| R21 | 83088 | RESISTOR 66.5 OHM RN55C 1% MTL FLM | | RN55C66R5F |
| R22 | 78912 | RESISTOR 196 OHM RN55C 1% MTL FLM | | RN55C1960F |
| R23 | 85059 | RESISTOR 174 OHM RN55C .5% MTL FLM | | RN55C1740D |
| R24 | 83142 | RESISTOR 78.7 OHM RN55C 1% MTL FLM | | RN55C78R7F |
| R25 | 85059 | RESISTOR 174 OHM RN55C .5% MTL FLM | | RN55C1740D |
| R26 | 85058 | RESISTOR 158 OHM RN55C .5% MTL FLM | | RN55C1580D |
| R27 | 83143 | RESISTOR 93.1 OHM RN55C 1% MTL FLM | | RN55C93R1F |
| R28 | 85058 | RESISTOR 158 OHM RN55C .5% MTL FLM | | RN55C1580D |
| R29 | 83859 | RESISTOR 147 OHM RN55C 1% MTL FLM | | RN55C1470F |
| R30 | 84987 | RESISTOR 107 OHM RN55C .5% MTL FLM | | RN55C1070D |
| R31 | 79724 | RESISTOR 8.06K OHM RN55C 1% MTL FLM | | RN55C8061F |
| R32 | 83859 | RESISTOR 147 OHM RN55C 1% MTL FLM | | RN55C1470F |
| R33 | 79724 | RESISTOR 8.06K OHM RN55C 1% MTL FLM | | RN55C8061F |
| R34 | 75687 | RESISTOR 47K OHM 1/4W 5% COMP | 01121 | RCR07G473JS |
| R35 | 84988 | RESISTOR 374 OHM RN55C .25% MTL FLM | | RN55C3740C |
| R36 | 84986 | RESISTOR 90.9 OHM RN55C .25% MTL FLM | | RN55C90R9C |
| R37 | 84986 | RESISTOR 90.9 OHM RN55C .25% MTL FLM | | RN55C90R9C |
| R38 | 83859 | RESISTOR 147 OHM RN55C 1% MTL FLM | | RN55C1470F |
| R39 | 84987 | RESISTOR 107 OHM RN55C .5% MTL FLM | | RN55C1070D |
| R40 | 79724 | RESISTOR 8.06K OHM RN55C 1% MTL FLM | | RN55C8061F |
| R41 | 79724 | RESISTOR 8.06K OHM RN55C 1% MTL FLM | | RN55C8061F |
| R42 | 83859 | RESISTOR 147 OHM RN55C 1% MTL FLM | | RN55C1470F |
| R43 | 75687 | RESISTOR 47K OHM 1/4W 5% COMP | 01121 | RCR07G473JS |
| R44 | 84988 | RESISTOR 374 OHM RN55C .25% MTL FLM | | RN55C3740C |
| R45 | 84986 | RESISTOR 90.9 OHM RN55C .25% MTL FLM | | RN55C90R9C |
| R46 | 84986 | RESISTOR 90.9 OHM RN55C .25% MTL FLM | | RN55C90R9C |
| | | | | |
| S01 | 148741 | SWITCH,10-POSITION, 2-POLE, 2-SECTIONS | | |
| S02 | 148740 | SWITCH, 5-POSITION, 4-POLE, 4-SECTIONS | | |

PWB ASSY-LOGIC SELECT CARD

REF DESIG PREFIX A1A2

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| CR02 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| CR03 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| CR04 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| CR05 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| CR06 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| CR07 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| CR08 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| CR09 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| CR10 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| CR11 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| CR12 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| CR13 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| CR14 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| CR15 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| CR16 | 81882 | LAMP LED RED .190 DIA .240 LNG 1.7V 20MA | 31718 | FLV110 |
| CR17 | 81882 | LAMP LED RED .190 DIA .240 LNG 1.7V 20MA | 31718 | FLV110 |
| J01 | 84357 | CONN HEADER DBL ROW RT ANGLE 20-PIN PC | 00779 | 1-87230-0 |
| Q01 | 35769 | TRANSSTR 2N3904 SIL NPN | 04713 | 2N3904 |
| R01 | 72046 | RESISTOR 18K OHM 1/4W 10% COMP | 01121 | RCR07G183KS |
| S01 | 84984 | SWITCH ROT 1P 3 POS NSH | | 5-11371-347 |
| S02 | 84985 | SWITCH ROT 2P 4 POS NSH | | 5-15841-347 |

CHASSIS ASSY-BB NOISE XMTR-MODEL 4660-1

REF DESIG PREFIX A02

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| P01 | 82954 | CONN MISC BODY W/O INSERTS 20 HOLES | 00779 | 87133-6 |
| P02 | 71027 | CONN RND 4-COND FEM CABLE MT LCK SPRING | 81312 | M4SLSH10 |
| P03 | 71027 | CONN RND 4-COND FEM CABLE MT LCK SPRING | 81312 | M4SLSH10 |
| P04 | 82954 | CONN MISC BODY W/O INSERTS 20 HOLES | 00779 | 87133-6 |
| P05 | 71027 | CONN RND 4-COND FEM CABLE MT LCK SPRING | 81312 | M4SLSH10 |
| P06 | 71027 | CONN RND 4-COND FEM CABLE MT LCK SPRING | 81312 | M4SLSH10 |
| P07 | 71027 | CONN RND 4-COND FEM CABLE MT LCK SPRING | 81312 | M4SLSH10 |
| P08 | 71027 | CONN RND 4-COND FEM CABLE MT LCK SPRING | 81312 | M4SLSH10 |
| W01 | 147579 | CABLE- RF, 6 1/2 IN. LONG | | |
| W01P1 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W01P2 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W02 | 147579 | CABLE- RF, 6 1/2 IN. LONG | | |
| W02P1 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W02P2 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W03 | 147579 | CABLE- RF, 6 1/2 IN. LONG | | |
| W03P1 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W03P2 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W04 | 147579 | CABLE- RF, 6 1/2 IN. LONG | | |
| W04P1 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W04P2 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W05 | 147579 | CABLE- RF, 6 1/2 IN. LONG | | |
| W05P1 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W05P2 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W06 | 147579 | CABLE- RF, 6 1/2 IN. LONG | | |
| W06P1 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W06P2 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W07 | 147579 | CABLE- RF, 6 1/2 IN. LONG | | |
| W07P1 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W07P2 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W08 | 147579 | CABLE- RF, 6 1/2 IN. LONG | | |
| W08P1 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W08P2 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W09 | 147579 | CABLE- RF, 6 1/2 IN. LONG | | |
| W09P1 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W09P2 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W10 | 147579 | CABLE- RF, 6 1/2 IN. LONG | | |
| W10P1 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W10P2 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W11 | 147580 | CABLE- RF, 19 IN. LONG | | |
| W11P1 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W11P2 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |
| W12 | 147532 | CABLE- RF 23 IN. LONG | | |
| W12P1 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W12P2 | 83150 | CONN COAX BNC MALE TO .160 CBL 75 OHM | 14949 | UPL-20-4 |

NOISE SOURCE ASSY

REF DESIG PREFIX A2A1

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| C01 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C02 | 78976 | CAPACITR 15-60 PF MIN CER DISC PC MT | 72982 | 538-011 F 15-60 |
| C03 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C04 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C05 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C06 | 70629 | CAPACITR 6.8 MF 35V SOLID TANT POL 10% | 80183 | 164D-685X903582 |
| C07 | 78700 | FACTORY SELECTED VALUE | | |
| C08 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C09 | 70629 | CAPACITR 6.8 MF 35V SOLID TANT POL 10% | 80183 | 164D-685X903582 |
| C10 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C11 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C12 | 78700 | FACTORY SELECTED VALUE | | |
| C13 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C14 | 78700 | FACTORY SELECTED VALUE | | |
| C15 | 81098 | CAPACITR .47 MF 50V CER MONO 20% | 72982 | 8131-050-651-474M |
| C16 | 70629 | CAPACITR 6.8 MF 35V SOLID TANT POL 10% | 80183 | 164D-685X903582 |
| C17 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| C18 | 70490 | CAPACITR 30 PF 500V SILVER MICA 5% | 14655 | CD15ED300J03 |
| C19 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| J01 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J02 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| Q01 | 78215 | TRANSSTR 2N5089 NPN SIL | 04713 | 2N5089 |
| Q02 | 83100 | TRANSSTR TIS 128 PNP SIL | 01295 | TIS 128 |
| Q03 | 77147 | TRANSSTR 2N3947 NPN SIL | 04713 | 2N3947 |
| Q04 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q05 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q06 | 77147 | TRANSSTR 2N3947 NPN SIL | 04713 | 2N3947 |
| Q07 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q08 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| R01 | 79713 | RESISTOR 2.00K OHM RN55C 1% MTL FLM | | RN55C2001F |
| R02 | 83089 | RESISTOR 75.0 OHM RN55C 1% MTL FLM | | RN55C75R0F |
| R03 | 81406 | RESISTOR 19.6K OHM RN55C 1% MTL FLM | | RN55C1962F |
| R04 | 81406 | RESISTOR 19.6K OHM RN55C 1% MTL FLM | | RN55C1962F |
| R05 | 78766 | RESISTOR 1.62K OHM RN55C 1% MTL FLM | | RN55C1621F |
| R06 | 71862 | RESISTOR 47 OHM 1/4W 10% COMP | 01121 | RCR07G470KS |
| R07 | 79984 | RESISTOR 4.02K OHM RN55C 1% MTL FLM | | RN55C4021F |
| R08 | 79318 | RESISTOR 121 OHM RN55C 1% MTL FLM | | RN55C1210F |
| R09 | 79725 | RESISTOR 3.16K OHM RN55C 1% MTL FLM | | RN55C3161F |
| R10 | 71951 | RESISTOR 1.0K OHM 1/4W 10% COMP | 01121 | RCR07G102KS |
| R11 | 80380 | RESISTOR 2.74K OHM RN55C 1% MTL FLM | | RN55C2741F |
| R12 | 76723 | RESISTOR 39 OHM 1/4W 10% COMP | 01121 | RCR07G390KS |
| R13 | 72039 | RESISTOR 15K OHM 1/4W 10% COMP | 01121 | RCR07G153KS |
| R14 | | NOT ASSIGNED | | |
| R15 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R16 | 83087 | RESISTOR 61.9 OHM RN55C 1% MTL FLM | | RN55C61R9F |
| R17 | 83081 | RESISTOR 15.4 OHM RN55C 1% MTL FLM | | RN55C15R4F |
| R18 | 83087 | RESISTOR 61.9 OHM RN55C 1% MTL FLM | | RN55C61R9F |
| R19 | 71951 | RESISTOR 1.0K OHM 1/4W 10% COMP | 01121 | RCR07G102KS |
| R20 | 71973 | RESISTOR 1.8K OHM 1/4W 10% COMP | 01121 | RCR07G182KS |
| R21 | 79713 | RESISTOR 2.00K OHM RN55C 1% MTL FLM | | RN55C2001F |
| R22 | 71989 | RESISTOR 3.3K OHM 1/4W 10% COMP | 01121 | RCR07G332KS |
| R23 | 79318 | RESISTOR 121 OHM RN55C 1% MTL FLM | | RN55C1210F |
| R24 | 71989 | RESISTOR 3.3K OHM 1/4W 10% COMP | 01121 | RCR07G332KS |
| R25 | 78725 | POT 100 OHM 1/2W CERMET PC MT 3/8 DIA | 01121 | SV1011 |
| R26 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R27 | 72039 | RESISTOR 15K OHM 1/4W 10% COMP | 01121 | RCR07G153KS |
| R28 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R29 | 76723 | RESISTOR 39 OHM 1/4W 10% COMP | 01121 | RCR07G390KS |
| R30 | 71951 | RESISTOR 1.0K OHM 1/4W 10% COMP | 01121 | RCR07G102KS |
| R31 | 71973 | RESISTOR 1.8K OHM 1/4W 10% COMP | 01121 | RCR07G182KS |
| R32 | 79713 | RESISTOR 2.00K OHM RN55C 1% MTL FLM | | RN55C2001F |
| R33 | 71989 | RESISTOR 3.3K OHM 1/4W 10% COMP | 01121 | RCR07G332KS |
| R34 | 79318 | RESISTOR 121 OHM RN55C 1% MTL FLM | | RN55C1210F |
| R35 | 71951 | RESISTOR 1.0K OHM 1/4W 10% COMP | 01121 | RCR07G102KS |
| R36 | 83089 | RESISTOR 75.0 OHM RN55C 1% MTL FLM | | RN55C75R0F |
| R37 | 83087 | RESISTOR 61.9 OHM RN55C 1% MTL FLM | | RN55C61R9F |
| R38 | 83087 | RESISTOR 61.9 OHM RN55C 1% MTL FLM | | RN55C61R9F |

NOISE SOURCE ASSY

REF DESIG PREFIX A2A1

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| R39 | 83081 | RESISTOR 15.4 OHM RN55C 1% MTL FLM | | RN55C15R4F |

FILTER ASSY-HI PASS, 316KHZ, MDL 4644-316

REF DESIG PREFIX A2A2

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| C01 | 83172 | CAPACITR .0082 MF 600V POLYSTYRENE 5% | 37942 | SX282 |
| C02 | 83169 | CAPACITR .005 MF 600V POLYSTYRENE 5% | 37942 | SX250 |
| C03 | 83175 | CAPACITR .039 MF 63V POLYSTYRENE 2.5% | 37942 | SXL139 |
| C04 | 83170 | CAPACITR .0056 MF 600V POLYSTYRENE 5% | 37942 | SX256 |
| C05 | 83171 | CAPACITR .0075 MF 600V POLYSTYRENE 5% | 37942 | SX275 |
| C06 | 83174 | CAPACITR .015 MF 63V POLYSTYRENE 2.5% | 37942 | SXL115 |
| C07 | 83173 | CAPACITR .01 MF 600V POLYSTYRENE 5% | 37942 | SX110 |
| J01 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J02 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| L01 | 133069 | COIL ASSY | | |
| L02 | 133070 | COIL ASSY | | |
| L03 | 133070 | COIL ASSY | | |

FILTER ASSY-LO PASS

REF DESIG PREFIX A2A3

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| AT01 | 35873 | ATTNUATR 1.5 DB FIXED T-PAD TO-5 CASE | | KM8 |
| CR01 | 71122 | DIODE 1N914 SIL 75V 75MA | 80368 | 1N914 |
| C01 | 78315 | CAPACITR 300 PF 500V SILVER MICA 1% | 84171 | DM-15-301F |
| C02 | 81332 | CAPACITR 65 PF 500V SILVER MICA 2% | 53021 | D155C650G03 |
| C03 | 78910 | CAPACITR 470 PF 500V SILVER MICA 1% | 84171 | DM-15-471F |
| C04 | 81828 | CAPACITR 330 PF 100V SILVER MICA 2% | 53021 | D151C331G03 |
| C05 | 80144 | CAPACITR 430 PF 500V SILVER MICA 1% | 84171 | DM15-431F |
| C06 | 78810 | CAPACITR 240 PF 500V SILVER MICA 1% | 84171 | DM-15-241F |
| C07 | 78805 | CAPACITR 180 PF 500V SILVER MICA 1% | 84171 | DM-15-181F |
| C08 | 78700 | FACTORY SELECTED VALUE | | |
| C09 | 81829 | CAPACITR 15 PF 500V SILVER MICA 2% | 53021 | D155C150G03 |
| C10 | 70470 | CAPACITR 10 PF 500V SILVER MICA 5% | 14655 | CD15CD100J03 |
| C11 | 73491 | CAPACITR 12 PF 500V SILVER MICA 5% | 14655 | CD15CD120J03 |
| C12 | 70490 | CAPACITR 30 PF 500V SILVER MICA 5% | 14655 | CD15ED300J03 |
| C13 | | NOT ASSIGNED | | |
| C14 | | NOT ASSIGNED | | |
| C15 | | NOT ASSIGNED | | |
| J01 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J02 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J03 | 71026 | CONN RND 4-COND MALE CHASSIS MT LCK RING | 81312 | M4PLRN |
| K01 | 83153 | RELAY 26.5VDC DPDT PC MT | 98927 | 50G8DN-1-A-700 |
| K02 | 83153 | RELAY 26.5VDC DPDT PC MT | 98927 | 50G8DN-1-A-700 |
| L01 | 133075 | COIL ASSY | | |
| L02 | 133076 | COIL ASSY | | |
| L03 | 142844 | COIL ASSEMBLY | | |

FILTER ASSY LO PASS, 7284KHZ, MDL 4645-7284

REF DESIG PREFIX A2A4

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| AT01 | 35875 | ATTNUATR 2.5 DB FIXED T-PAD TC-5 CASE | | KM6 |
| CR01 | 71122 | DIODE 1N914 SIL 75V 75MA | 80368 | 1N914 |
| C01 | 78806 | CAPACITR 200 PF 500V SILVER MICA 1% | 84171 | DM-15-201F |
| C02 | 70498 | CAPACITR 47 PF 500V SILVER MICA 5% | 14655 | CD15ED470J03 |
| C03 | 78817 | CAPACITR 360 PF 500V SILVER MICA 1% | 84171 | DM-15-361F |
| C04 | 80923 | CAPACITR 130 PF 500V SILVER MICA 1% | 84171 | DM15-131F |
| C05 | 78815 | CAPACITR 300 PF 500V SILVER MICA 1% | 84171 | DM-15-301F |
| C06 | 78805 | CAPACITR 180 PF 500V SILVER MICA 1% | 84171 | DM-15-181F |
| C07 | 77963 | CAPACITR 100 PF 300V SILVER MICA 2% | 14655 | CD6FC101G03 |
| C08 | 78700 | FACTORY SELECTED VALUE | | |
| C09 | | NOT ASSIGNED | | |
| C10 | 81829 | CAPACITR 15 PF 500V SILVER MICA 2% | 53021 | D155C150G03 |
| C11 | | NOT ASSIGNED | | |
| C12 | | NOT ASSIGNED | | |
| C13 | 80923 | CAPACITR 130 PF 500V SILVER MICA 1% | 84171 | DM15-131F |
| C14 | | NOT ASSIGNED | | |
| C15 | 70470 | CAPACITR 10 PF 500V SILVER MICA 5% | 14655 | CD15CD100J03 |
| J01 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J02 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J03 | 71026 | CONN RND 4-COND MALE CHASSIS MT LCK RING | 81312 | M4PLRN |
| K01 | 83153 | RELAY 26.5VDC DPDT PC MT | 98927 | 50GBDN-1-A-700 |
| K02 | 83153 | RELAY 26.5VDC DPDT PC MT | 98927 | 50GBDN-1-A-700 |
| L01 | 142843 | COIL ASSEMBLY | | |
| L02 | 142844 | COIL ASSEMBLY | | |
| L03 | 142844 | COIL ASSEMBLY | | |

FILTER ASSY LO PASS, 8160KHZ, MDL 4645-8160

REF DESIG PREFIX A2A5

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| AT01 | 35876 | ATTNUATR 3 DB FIXED T-PAD TO-5 CASE | | KM5 |
| CR01 | 71122 | DIODE 1N914 SIL 75V 75MA | 80368 | 1N914 |
| C01 | 78805 | CAPACITR 180 PF 500V SILVER MICA 1% | 84171 | DM-15-181F |
| C02 | 78496 | CAPACITR 43 PF 500V SILVER MICA 5% | 14655 | CD15ED430J03 |
| C03 | 78437 | CAPACITR 27 PF 500V SILVER MICA 5% | 14655 | CD15ED270J03 |
| C04 | 78408 | CAPACITR 220 PF 500V SILVER MICA 1% | 84171 | DM-15-221F |
| C05 | 78813 | CAPACITR 270 PF 500V SILVER MICA 1% | 84171 | DM-15-271F |
| C06 | 78805 | CAPACITR 180 PF 500V SILVER MICA 1% | 84171 | DM-15-181F |
| C07 | 82399 | CAPACITR 75 PF 500V SILVER MICA 1% | 84171 | DM-15-750F |
| C08 | 78700 | FACTORY SELECTED VALUE | | |
| C09 | 77955 | CAPACITR 3 PF 500V SILVER MICA +-1PF | 14655 | CD6CD030C03 |
| C10 | 73492 | CAPACITR 15 PF 500V SILVER MICA 5% | 00656 | ADM15C150J500 |
| C11 | 73491 | CAPACITR 12 PF 500V SILVER MICA 5% | 14655 | CD15CD120J03 |
| C12 | 78815 | CAPACITR 300 PF 500V SILVER MICA 1% | 84171 | DM-15-301F |
| C13 | 73492 | CAPACITR 15 PF 500V SILVER MICA 5% | 00656 | ADM15C150J500 |
| C14 | | NOT ASSIGNED | | |
| C15 | 79709 | CAPACITR 7 PF 500V SILVER MICA 10% | 84171 | DM15-070K |
| J01 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J02 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J03 | 71026 | CONN RND 4-COND MALE CHASSIS MT LCK RING | 81312 | M4PLRN |
| K01 | 83153 | RELAY 26.5VDC DPDT PC MT | 98927 | 50G8DN-1-A-700 |
| K02 | 83153 | RELAY 26.5VDC DPDT PC MT | 98927 | 50G8DN-1-A-700 |
| L01 | 148692 | COIL ASSY | | |
| L02 | 148693 | COIL ASSY | | |
| L03 | 148693 | COIL ASSY | | |

FILTER ASSY-LO PASS, MDL 4645-10

REF DESIG PREFIX A2A6

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| AT01 | 82263 | ATTNUATR 4 DB FIXED T-PAD TO-5 CASE | | KM, BY DESCRIPTION |
| C01 | 78808 | CAPACITR 220 PF 500V SILVER MICA 1% | 84171 | DM-15-221F |
| C02 | 73491 | CAPACITR 12 PF 500V SILVER MICA 5% | 14655 | CD15CD120J03 |
| C03 | 80144 | CAPACITR 430 PF 500V SILVER MICA 1% | 84171 | DM15-431F |
| C04 | 81830 | CAPACITR 35 PF 500V SILVER MICA 2% | 53021 | D155C350G03 |
| C05 | 79819 | CAPACITR 470 PF 500V SILVER MICA 1% | 84171 | DM-15-471F |
| C06 | 81829 | CAPACITR 15 PF 500V SILVER MICA 2% | 53021 | D155C150G03 |
| C07 | 80144 | CAPACITR 430 PF 500V SILVER MICA 1% | 84171 | DM15-431F |
| C08 | 81830 | CAPACITR 35 PF 500V SILVER MICA 2% | 53021 | D155C350G03 |
| C09 | 73491 | CAPACITR 12 PF 500V SILVER MICA 5% | 14655 | CD15CD120J03 |
| C10 | 78808 | CAPACITR 220 PF 500V SILVER MICA 1% | 84171 | DM-15-221F |
| J01 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J02 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J03 | 71026 | CONN RND 4-COND MALE CHASSIS MT LCK RING | 81312 | M4PLRN |
| K01 | 83153 | RELAY 26.5VDC DPDT PC MT | 98927 | 50GBDN-1-A-700 |
| K02 | 83153 | RELAY 26.5VDC DPDT PC MT | 98927 | 50GBDN-1-A-700 |
| L01 | 147561 | COIL ASSY | | |
| L02 | 147562 | COIL ASSY | | |
| L03 | 147562 | COIL ASSY | | |
| L04 | 147561 | COIL ASSY | | |

AMP ASSY AGC AND DETECTOR

REF DESIG PREFIX A2A7

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 74186 | DIODE 1N935A TC REF 9.0V .01% .5W | 04713 | 1N935A |
| CR02 | 81807 | DIODE MV1401 VARACTOR SIL WIRE LEADS | 04713 | MV1401 |
| CR03 | 81807 | DIODE MV1401 VARACTOR SIL WIRE LEADS | 04713 | MV1401 |
| CR04 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR05 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR06 | 74186 | DIODE 1N935A TC REF 9.0V .01% .5W | 04713 | 1N935A |
| CR07 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| C01 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C02 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| C03 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| C04 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C05 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C06 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C07 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C08 | 78700 | FACTORY SELECTED VALUE | | |
| C09 | | NOT ASSIGNED | | |
| C10 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C11 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C12 | 78700 | FACTORY SELECTED VALUE | | |
| C13 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C14 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C15 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C16 | 70629 | CAPACITR 6.8 MF 35V SOLID TANT POL 10% | 80183 | 1640-685X903582 |
| C17 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C18 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C19 | 78700 | FACTORY SELECTED VALUE | | |
| C20 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C21 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C22 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C23 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C24 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C25 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| C26 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C27 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| J01 | 71062 | CONN COAX BNC FEM TO CUP D HOLE MT | | UG-625/U |
| J02 | 71062 | CONN COAX BNC FEM TO CUP D HOLE MT | | UG-625/U |
| J03 | 71062 | CONN COAX BNC FEM TO CUP D HOLE MT | | UG-625/U |
| J04 | 71062 | CONN COAX BNC FEM TO CUP D HOLE MT | | UG-625/U |
| K01 | 83153 | RELAY 26.5VDC DPDT PC MT | 98927 | 50GBDN-1-A-700 |
| K02 | 83153 | RELAY 26.5VDC DPDT PC MT | 98927 | 50GBDN-1-A-700 |
| L01 | 78716 | INDUCTOR 100 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L02 | 78716 | INDUCTOR 100 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L03 | 81718 | CORE BEAD FERRITE 7D .138X.037X.150L | 78488 | 57-1413 |
| L04 | 81718 | CORE BEAD FERRITE 7D .138X.037X.150L | 78488 | 57-1413 |
| Q01 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q02 | 76960 | TRANSSTR 2N4221 FET N-CHNL JUNC | 04713 | 2N4221 |
| Q03 | 83100 | TRANSSTR TIS 128 PNP SIL | 01295 | TIS 128 |
| Q04 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q05 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q06 | 79329 | TRANSSTR 2N5109 NPN SIL | 79089 | 2N5109 |
| Q07 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q08 | 77148 | TRANSSTR 2N3251 PNP SIL | 04713 | 2N3251 |
| Q09 | 77147 | TRANSSTR 2N3947 NPN SIL | 04713 | 2N3947 |
| R01 | 83089 | RESISTOR 75.0 OHM RN55C 1% MTL FLM | | RN55C75R0F |
| R02 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| R03 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| R04 | 71989 | RESISTOR 3.3K OHM 1/4W 10% COMP | 01121 | RCR07G332KS |
| R05 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R06 | 71989 | RESISTOR 3.3K OHM 1/4W 10% COMP | 01121 | RCR07G332KS |
| R07 | 78963 | RESISTOR 1.00 MEG RN60C 1% MTL FLM | | RN60C1004F |
| R08 | 78963 | RESISTOR 1.00 MEG RN60C 1% MTL FLM | | RN60C1004F |

AMP ASSY AGC AND DETECTOR

REF DESIG PREFIX A2A7

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| R09 | 71938 | RESISTOR 680 OHM 1/4W 10% COMP | 01121 | RCR07G621KS |
| R10 | 72034 | RESISTOR 12K OHM 1/4W 10% COMP | 01121 | RCR07G123KS |
| R11 | 81733 | RESISTOR 750 OHM 1/4W 5% COMP | 01121 | RCR07G751JS |
| R12 | 76275 | RESISTOR 22 OHM 1/4W 10% COMP | 01121 | RCR07G220KS |
| R13 | 71977 | RESISTOR 2.2K OHM 1/4W 10% COMP | 01121 | RCR07G222KS |
| R14 | 71989 | RESISTOR 3.3K OHM 1/4W 10% COMP | 01121 | RCR07G332KS |
| R15 | 72068 | RESISTOR 39K OHM 1/4W 10% COMP | 01121 | RCR07G393KS |
| R16 | 72064 | RESISTOR 33K OHM 1/4W 10% COMP | 01121 | RCR07G333KS |
| R17 | 71951 | RESISTOR 1.0K OHM 1/4W 10% COMP | 01121 | RCR07G102KS |
| R18 | 71960 | RESISTOR 1.2K OHM 1/4W 10% COMP | 01121 | RCR07G122KS |
| R19 | 76248 | RESISTOR 1.00K OHM RN60C 1% MTL FLM | | RN60C1001F |
| R20 | 82101 | RESISTOR 1.47K OHM RN60C 1% MTL FLM | | RN60C1471F |
| R21 | 78461 | RESISTOR 100 OHM RN60C 1% MTL FLM | | RN60C1000F |
| R22 | 71954 | RESISTOR 1.0K OHM 1/2W 10% COMP | 01121 | RCR20G102KS |
| R23 | 79895 | RESISTOR 75.0 OHM RN60C 1% MTL FLM | | RN60C75R0F |
| R24 | 82304 | RESISTOR 4.3 OHM 1/4W 5% COMP | 01121 | RCR07G4R3JS |
| R25 | 83098 | RESISTOR 649 OHM RN55C 1% MTL FLM | | RN55C6490F |
| R26 | 82304 | RESISTOR 4.3 OHM 1/4W 5% COMP | 01121 | RCR07G4R3JS |
| R27 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R28 | 71989 | RESISTOR 3.3K OHM 1/4W 10% COMP | 01121 | RCR07G332KS |
| R29 | 71989 | RESISTOR 3.3K OHM 1/4W 10% COMP | 01121 | RCR07G332KS |
| R30 | 79132 | RESISTOR 200K OHM RN55C 1% MTL FLM | | RN55C2003F |
| R31 | 82178 | RESISTOR 499K OHM RN60C 1% MTL FLM | | RN60C4993F |
| R32 | 78577 | RESISTOR 20.0K OHM RN60C 1% MTL FLM | | RN60C2002F |
| R33 | 78577 | RESISTOR 20.0K OHM RN60C 1% MTL FLM | | RN60C2002F |
| R34 | 71989 | RESISTOR 3.3K OHM 1/4W 10% COMP | 01121 | RCR07G332KS |
| R35 | 82178 | RESISTOR 499K OHM RN60C 1% MTL FLM | | RN60C4993F |
| R36 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R37 | 71977 | RESISTOR 2.2K OHM 1/4W 10% COMP | 01121 | RCR07G222KS |
| R38 | 79713 | RESISTOR 2.00K OHM RN55C 1% MTL FLM | | RN55C2001F |
| R39 | 82166 | RESISTOR 249K OHM RN60C 1% MTL FLM | | RN60C2493F |
| R40 | 78723 | POT 10K OHM 1/2W CERMET PC MT 3/8 DIA | 01121 | SV1031 |
| R41 | 71907 | RESISTOR 220 OHM 1/4W 10% COMP | 01121 | RCR07G221KS |
| R42 | 79712 | RESISTOR 36.5K OHM RN55C 1% MTL FLM | | RN55C3652F |
| R43 | 79177 | | | |
| R44 | | NOT ASSIGNED | | |
| R45 | 72011 | RESISTOR 5.6K OHM 1/4W 10% COMP | 01121 | RCR07G562KS |
| R46 | 72002 | RESISTOR 4.7K OHM 1/4W 10% COMP | 01121 | RCR07G472KS |
| R47 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R48 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R49 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R50 | 82112 | RESISTOR 3.48K OHM RN60C 1% MTL FLM | | RN60C3481F |
| R51 | 83089 | RESISTOR 75.0 OHM RN55C 1% MTL FLM | | RN55C75R0F |
| U01 | 78219 | IC TEMP CONT DIFF PAIR 726C FQ | 13715 | 726 HC |
| U02 | 81840 | IC OP AMP 8PIN DIP INT.COMP. DUAL 741C | 04713 | MC1458P1 |

FILTER ASSY-NOTCH, 1248KHZ, MDL 4646-1248B

REF DESIG PREFIX A2A8

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| C01 | 78803 | CAPACITR 150 PF 500V SILVER MICA 1% | 84171 | DM-15-151F |
| C02 | 83173 | CAPACITR .01 MF 600V POLYSTYRENE 5% | 37942 | SX110 |
| C03 | 78816 | CAPACITR 330 PF 500V SILVER MICA 1% | 84171 | DM-15-331F |
| C04 | 83173 | CAPACITR .01 MF 600V POLYSTYRENE 5% | 37942 | SX110 |
| C05 | 78803 | CAPACITR 150 PF 500V SILVER MICA 1% | 84171 | DM-15-151F |
| C06 | 81822 | CAPACITR 36 PF 100V SILVER MICA 2% | 53021 | D151C360G03 |
| C07 | 77901 | CAPACITR .0015 MF 500V SILVER MICA 5% | 14655 | CD19FD152J03 |
| C08 | 73492 | CAPACITR 15 PF 500V SILVER MICA 5% | 00656 | ADM15C150J500 |
| C09 | 77901 | CAPACITR .0015 MF 500V SILVER MICA 5% | 14655 | CD19FD152J03 |
| C10 | 81822 | CAPACITR 36 PF 100V SILVER MICA 2% | 53021 | D151C360G03 |
| J01 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J02 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| L01 | 147793 | COIL ASSY | | |
| L02 | 147795 | COIL ASSY | | |
| L03 | 147794 | COIL ASSY | | |
| L04 | 147795 | COIL ASSY | | |
| L05 | 147793 | COIL ASSY | | |

FILTER ASSY-NOTCH, 5340KHZ, MDL 4646-5340

REF DESIG PREFIX A2A9

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| C01 | 70475 | CAPACITR 12 PF 500V CER DISC | 71590 | DD-120 |
| C02 | 78809 | CAPACITR 230 PF 500V SILVER MICA 1% | 84171 | DM-15-231F |
| C03 | 81792 | CAPACITR 30 PF CER DISC | 72982 | 805-024-U1G0-300J |
| C04 | 78809 | CAPACITR 230 PF 500V SILVER MICA 1% | 84171 | DM-15-231F |
| C05 | 70475 | CAPACITR 12 PF 500V CER DISC | 71590 | DD-120 |
| C06 | 76391 | CAPACITR 1.5 PF 500V CER TUBULAR | 00656 | CC20CK1R5C |
| C07 | 81821 | CAPACITR 33 PF 100V SILVER MICA 2% | 53021 | D151C330G03 |
| C08 | | NOT ASSIGNED | | |
| C09 | 81821 | CAPACITR 33 PF 100V SILVER MICA 2% | 53021 | D151C330G03 |
| C10 | 76391 | CAPACITR 1.5 PF 500V CER TUBULAR | 00656 | CC20CK1R5C |
| J01 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J02 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| L01 | 138169 | COIL ASSY | | |
| L02 | 138162 | COIL ASSY | | |
| L03 | 138170 | COIL ASSY | | |
| L04 | 138162 | COIL ASSY | | |
| L05 | 138169 | COIL ASSY | | |

FILTER ASSY-NOTCH, 6900KHZ, MDL 4646-69008

REF DESIG PREFIX A2A10

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 71122 | DIODE 1N914 SIL 75V 75MA | 80368 | 1N914 |
| C01 | 70475 | CAPACITR 12 PF 500V CER DISC | 71590 | DD-120 |
| C02 | 70529 | CAPACITR 220 PF 500V SILVER MICA 5% | 14655 | CD15FD221J03 |
| C03 | 81938 | CAPACITR 20 PF 500V CER DISC | 72982 | 831-C0G0-200J |
| C04 | 70529 | CAPACITR 220 PF 500V SILVER MICA 5% | 14655 | CD15FD221J03 |
| C05 | 81926 | CAPACITR 10 PF 500V CER DISC | 72982 | 831-C0H0-100C |
| C06 | 76381 | CAPACITR 1.5 PF 500V CER TUBULAR | 00656 | CC20CK1R5C |
| C07 | | NOT ASSIGNED | | |
| C08 | 35762 | CAPACITR 8 PF 500V CER DISC | 72982 | 831-C0H0-809C |
| C09 | | NOT ASSIGNED | | |
| C10 | 76381 | CAPACITR 1.5 PF 500V CER TUBULAR | 00656 | CC20CK1R5C |
| J01 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J02 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J03 | 71026 | CONN RND 4-COND MALE CHASSIS MT LCK RING | 81312 | M4PLRN |
| K01 | 83153 | RELAY 26.5VDC DPDT PC MT | 98927 | 50G8DN-1-A-700 |
| K02 | 83153 | RELAY 26.5VDC DPDT PC MT | 98927 | 50G8DN-1-A-700 |
| L01 | 139171 | COIL ASSY | | |
| L02 | 138163 | COIL ASSY | | |
| L03 | 139172 | COIL ASSY | | |
| L04 | 138163 | COIL ASSY | | |
| L05 | 138171 | COIL ASSY | | |

FILTER ASSY-NOTCH, 7600KHZ, MDL 4646-7600B

REF DESIG PREFIX A2A11

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 71122 | DIODE 1N914 SIL 75V 75MA | 80368 | 1N914 |
| C01 | 73491 | CAPACITR 12 PF 500V SILVER MICA 5% | 14655 | CD15CD120J03 |
| C02 | 70522 | CAPACITR 150 PF 500V SILVER MICA 5% | 14655 | CD15FD151J03 |
| C03 | 70495 | CAPACITR 33 PF 1KV CER DISC | 71590 | DD330 |
| C04 | 70522 | CAPACITR 150 PF 500V SILVER MICA 5% | 14655 | CD15FD151J03 |
| C05 | 81923 | CAPACITR 6 PF 500V CER DISC | 72982 | 831-COH0-609C |
| C06 | 81923 | CAPACITR 6 PF 500V CER DISC | 72982 | 831-COH0-609C |
| C07 | 70487 | CAPACITR 27 PF 500V SILVER MICA 5% | 14655 | CD15ED270J03 |
| C08 | | NOT ASSIGNED | | |
| C09 | 70487 | CAPACITR 27 PF 500V SILVER MICA 5% | 14655 | CD15ED270J03 |
| C10 | 70470 | CAPACITR 10 PF 500V SILVER MICA 5% | 14655 | CD15CD100J03 |
| J01 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J02 | 71063 | CONN COAX BNC FEM TO CUP DBL D HOLE MT | | UG-657/U |
| J03 | 71026 | CONN RND 4-COND MALE CHASSIS MT LCK RING | 81312 | M4PLRN |
| K01 | 83153 | RELAY 26.5VDC DPDT PC MT | 98927 | 50GBDN-1-A-700 |
| K02 | 83153 | RELAY 26.5VDC DPDT PC MT | 98927 | 50GBDN-1-A-700 |
| L01 | 138167 | COIL ASSY | | |
| L02 | 138163 | COIL ASSY | | |
| L03 | 138168 | COIL ASSY | | |
| L04 | 138163 | COIL ASSY | | |
| L05 | 138167 | COIL ASSY | | |

PRE-EMPHASIS NETWORK PWR ASSY

REF DESIG PREFIX A2A12

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| C01 | 82397 | CAPACITR 30 PF 500V SILVER MICA 1% | 84171 | DM-15-300F |
| C02 | 79915 | CAPACITR 300 PF 500V SILVER MICA 1% | 84171 | DM-15-301F |
| J01 | 84940 | CONN COAX CONHX SNAP-ON MALE PC MT | | 51-151-0000 |
| J02 | 84940 | CONN COAX CONHX SNAP-ON MALE PC MT | | 51-151-0000 |
| J03 | 84940 | CONN COAX CONHX SNAP-ON MALE PC MT | | 51-151-0000 |
| L01 | 147563 | COIL ASSY | | |
| R01 | 85075 | RESISTOR 49.9 OHM RN55C .25% MTL FLM | | RN55C49R9C |
| R02 | 85075 | RESISTOR 49.9 OHM RN55C .25% MTL FLM | | RN55C49R9C |
| R03 | 83912 | RESISTOR 7.15K OHM RN55C 1% MTL FLM | | RN55C7151F |
| R04 | 85076 | RESISTOR 31.6 OHM RN55C .25% MTL FLM | | RN55C31R6C |
| T01 | 147736 | XFMR, 75/124 OHM SPEC CONTROL DWG | | |

REAR PANEL ASSY-NOISE XMTR, SER 4660

REF DESIG PREFIX A03

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| A01 | 1+7786 | PWB ASSY- POWER SUPPLY, -24V | | |

PWB ASSY-POWER SUPPLY, -24V

REF DESIG PREFIX A3A1

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 80764 | RECTIFIER ASSY 200V 2A | 83003 | VS-247 |
| CR02 | 71143 | DIODE 1N4735A SI ZEN 6.2V 5% 1W | 04713 | 1N4735A |
| C01 | 75221 | CAPACITR 1100 MF 50V | 80183 | 39DU8G050HP4 |
| C02 | 75221 | CAPACITR 1100 MF 50V | 80183 | 39DU8G050HP4 |
| JF01 | 83758 | CONN AC MALE 3-COND 6A W/FUSE BLK | | 6J1 |
| J01 | 84930 | CONN HEADER DBL ROW STRAIGHT 20-PIN PC | | 1-87227-0 |
| Q01 | 77147 | TRANSSTR 2N3947 NPN SIL | 04713 | 2N3947 |
| R01 | 71813 | RESISTOR .5 OHM 3W | 24681 | VAL3 |
| R02 | 72034 | RESISTOR 12K OHM 1/4W 10% COMP | 01121 | RCR07G123KS |
| R03 | 72034 | RESISTOR 12K OHM 1/4W 10% COMP | 01121 | RCR07G123KS |
| R04 | 71931 | RESISTOR 560 OHM 1/4W 10% COMP | 01121 | RCR07G561KS |
| S01 | 84822 | SWITCH TOG DPDT FLAT TOG 5A 120VAC | | 7201PYPZG |
| T01 | 84768 | XFMR 2SEC 24V 1A 2PRI 115V 50/500H | | DPC24-1000 |
| U01 | 83155 | IC VOLTAGE REGULATOR -24 VOLTS | 04713 | MC7924CP |

MODULE ASSY IF LO

REF DESIG PREFIX A03

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 84467 | DIODE MV109 VARACTOR SIL | 04713 | MV109 |
| CR02 | 84467 | DIODE MV109 VARACTOR SIL | 04713 | MV109 |
| CR03 | 85119 | DIODE 5082-2811 UHF SCHOTTKY | | 5082-2811 |
| C01 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C02 | 81971 | CAPACITR 2.2 PF 100V CER DISC | 72982 | 835-024-C0G02298 |
| C03 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C04 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C05 | 82007 | CAPACITR 4.3 PF 100V CER DISC | 72982 | 835-024-COHO-439C |
| C06 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C07 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C08 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C09 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C10 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C11 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C12 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C13 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| C14 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| C15 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| C16 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C17 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C18 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C19 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C20 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C21 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C22 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C23 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C24 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C25 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C26 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C27 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C28 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C29 | 79385 | CAPACITR 430 PF 500V SILVER MICA 5% | 14655 | CD15FD431J03 |
| C30 | 79385 | CAPACITR 430 PF 500V SILVER MICA 5% | 14655 | CD15FD431J03 |
| C31 | 77318 | CAPACITR .22 MF 200V MET MYLAR OVAL 10% | 84411 | X663F |
| C32 | 77318 | CAPACITR .22 MF 200V MET MYLAR OVAL 10% | 84411 | X663F |
| C33 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C34 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C35 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C36 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C37 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C38 | 79385 | CAPACITR 430 PF 500V SILVER MICA 5% | 14655 | CD15FD431J03 |
| C39 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C40 | 78700 | FACTORY SELECTED VALUE | | |
| C41 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C42 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C43 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C44 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C45 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C46 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C47 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C48 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C49 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C50 | 83258 | CAPACITR CHIP .1 MF 50V | | ULA555C104M |
| C51 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C52 | 82002 | CAPACITR 2.4 PF 100V CER DISC | 72982 | 835-024-COJO-249C |
| C53 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C54 | 81971 | CAPACITR 2.2 PF 100V CER DISC | 72982 | 835-024-C0G02298 |
| C55 | 78700 | FACTORY SELECTED VALUE | | |
| C56 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C57 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C58 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C59 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C60 | 81971 | CAPACITR 2.2 PF 100V CER DISC | 72982 | 835-024-C0G02298 |
| C61 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C62 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| J01 | | NOT ASSIGNED | | |
| J02 | | NOT ASSIGNED | | |
| J03 | | NOT ASSIGNED | | |
| J04 | 84940 | CONN COAX CONHX SNAP-ON MALE PC MT | | 51-151-0000 |

MODULE ASSY IF LO

REF DESIG PREFIX A03

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| J05 | 84940 | CONN COAX CONHX SNAP-ON MALE PC MT | | 51-151-0000 |
| J06 | 84940 | CONN COAX CONHX SNAP-ON MALE PC MT | | 51-151-0000 |
| J07 | 84940 | CONN COAX CONHX SNAP-ON MALE PC MT | | 51-151-0000 |
| L01 | 78134 | INDUCTOR 1.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L02 | 78134 | INDUCTOR 1.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L03 | 78134 | INDUCTOR 1.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L04 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L05 | 78134 | INDUCTOR 1.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L06 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L07 | 78134 | INDUCTOR 1.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L08 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L09 | 78134 | INDUCTOR 1.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L10 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L11 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L12 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L13 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L14 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L15 | 145341 | INDUCTOR 1.5 T #24 6-32X3/8 INCH CARB J | 02113 | PER CONT. DWG. |
| L16 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L17 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L18 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L19 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L20 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L21 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L22 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L23 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L24 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| Q01 | 77147 | TRANSSTR 2N3947 NPN SIL | 04713 | 2N3947 |
| Q02 | 77147 | TRANSSTR 2N3947 NPN SIL | 04713 | 2N3947 |
| Q03 | 84917 | TRANSSTR U311 FET N-CHNL JUNC | | U311 |
| Q04 | 77412 | TRANSSTR 2N4416 FET N-CHNL JUNC | 61637 | 2N4416 |
| Q05 | 85042 | TRANSSTR MRF 517 NPN SIL | | MRF 517 |
| Q06 | 85042 | TRANSSTR MRF 517 NPN SIL | | MRF 517 |
| Q07 | 81786 | TRANSSTR SRF-378 SIL NPN | 04713 | SRF-378 |
| Q08 | 81786 | TRANSSTR SRF-378 SIL NPN | 04713 | SRF-378 |
| R01 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R02 | 71931 | RESISTOR 560 OHM 1/4W 10% COMP | 01121 | RCR07G561KS |
| R03 | 71913 | RESISTOR 270 OHM 1/4W 10% COMP | 01121 | RCR07G271KS |
| R04 | 71894 | RESISTOR 120 OHM 1/4W 10% COMP | 01121 | RCR07G121KS |
| R05 | 71920 | RESISTOR 390 OHM 1/4W 10% COMP | 01121 | RCR07G391KS |
| R06 | 71897 | RESISTOR 150 OHM 1/4W 10% COMP | 01121 | RCR07G151KS |
| R07 | 71862 | RESISTOR 47 OHM 1/4W 10% COMP | 01121 | RCR07G470KS |
| R08 | 71857 | RESISTOR 33 OHM 1/4W 10% COMP | 01121 | RCR07G330KS |
| R09 | 71951 | RESISTOR 1.0K OHM 1/4W 10% COMP | 01121 | RCR07G102KS |
| R10 | 71977 | RESISTOR 2.2K OHM 1/4W 10% COMP | 01121 | RCR07G222KS |
| R11 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R12 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R13 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R14 | 76707 | RESISTOR 2.7 OHM 1/4W 10% COMP | 01121 | RCR07G2R7KS |
| R15 | | NOT ASSIGNED | | |
| R16 | | NOT ASSIGNED | | |
| R17 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R18 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R19 | 71977 | RESISTOR 2.2K OHM 1/4W 10% COMP | 01121 | RCR07G222KS |
| R20 | 71951 | RESISTOR 1.0K OHM 1/4W 10% COMP | 01121 | RCR07G102KS |
| R21 | 83916 | RESISTOR 10.5K OHM RN55C 1% MTL FLM | | RN55C1052F |
| R22 | 83916 | RESISTOR 10.5K OHM RN55C 1% MTL FLM | | RN55C1052F |
| R23 | 83916 | RESISTOR 10.5K OHM RN55C 1% MTL FLM | | RN55C1052F |
| R24 | 83916 | RESISTOR 10.5K OHM RN55C 1% MTL FLM | | RN55C1052F |
| R25 | 83426 | RESISTOR 2.87K OHM RN55C 1% MTL FLM | | RN55C2871F |
| R26 | 83426 | RESISTOR 2.87K OHM RN55C 1% MTL FLM | | RN55C2871F |
| R27 | 71857 | RESISTOR 33 OHM 1/4W 10% COMP | 01121 | RCR07G330KS |
| R28 | 71857 | RESISTOR 33 OHM 1/4W 10% COMP | 01121 | RCR07G330KS |
| R29 | 74727 | RESISTOR 10K OHM 1/4W 5% COMP | 01121 | RCR07G103JS |
| R30 | 74702 | RESISTOR 1.0K OHM 1/4W 5% COMP | 01121 | RCR07G102JS |
| R31 | 75668 | RESISTOR 8.2K OHM 1/4W 5% COMP | 01121 | RCR07G822JS |
| R32 | 72064 | RESISTOR 33K OHM 1/4W 10% COMP | 01121 | RCR07G333KS |
| R33 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |

MODULE ASSY IF LO

REF DESIG PREFIX A03

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| R34 | 71941 | RESISTOR 820 OHM 1/4W 10% COMP | 01121 | RCR07G821KS |
| R35 | 71938 | RESISTOR 680 OHM 1/4W 10% COMP | 01121 | RCR07G621KS |
| R36 | 74714 | RESISTOR 3.3K OHM 1/4W 5% COMP | 01121 | RCR07G332JS |
| R37 | 71913 | RESISTOR 270 OHM 1/4W 10% COMP | 01121 | RCR07G271KS |
| R38 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R39 | 71907 | RESISTOR 220 OHM 1/4W 10% COMP | 01121 | RCR07G221KS |
| R40 | 74693 | RESISTOR 390 OHM 1/4W 5% COMP | 01121 | RCR07G391JS |
| R41 | 74687 | RESISTOR 220 OHM 1/4W 5% COMP | 01121 | RCR07G221JS |
| R42 | 71931 | RESISTOR 560 OHM 1/4W 10% COMP | 01121 | RCR07G561KS |
| R43 | 71913 | RESISTOR 270 OHM 1/4W 10% COMP | 01121 | RCR07G271KS |
| R44 | 71894 | RESISTOR 120 OHM 1/4W 10% COMP | 01121 | RCR07G121KS |
| R45 | 74693 | RESISTOR 390 OHM 1/4W 5% COMP | 01121 | RCR07G391JS |
| R46 | 71862 | RESISTOR 47 OHM 1/4W 10% COMP | 01121 | RCR07G470KS |
| R47 | 71857 | RESISTOR 33 OHM 1/4W 10% COMP | 01121 | RCR07G330KS |
| R48 | 71913 | RESISTOR 270 OHM 1/4W 10% COMP | 01121 | RCR07G271KS |
| R49 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R50 | 71913 | RESISTOR 270 OHM 1/4W 10% COMP | 01121 | RCR07G271KS |
| R51 | 71894 | RESISTOR 120 OHM 1/4W 10% COMP | 01121 | RCR07G121KS |
| R52 | 71876 | RESISTOR 68 OHM 1/4W 10% COMP | 01121 | RCR07G680KS |
| R53 | 71920 | RESISTOR 390 OHM 1/4W 10% COMP | 01121 | RCR07G391KS |
| R54 | 71931 | RESISTOR 560 OHM 1/4W 10% COMP | 01121 | RCR07G561KS |
| R55 | 71862 | RESISTOR 47 OHM 1/4W 10% COMP | 01121 | RCR07G470KS |
| R56 | 71857 | RESISTOR 33 OHM 1/4W 10% COMP | 01121 | RCR07G330KS |
| R57 | 71897 | RESISTOR 150 OHM 1/4W 10% COMP | 01121 | RCR07G151KS |
| U01 | 84832 | IC ECL 10/11 TWO-MODULUS PRESCALER | | MC12013P |
| U02 | 84877 | IC TTL DUAL 4-IN NAND BUFFER | | SN74S40N |
| U03 | 81203 | IC PHASE FREQUENCY DETECTOR | 04713 | MC4044P |
| U04 | 84878 | IC TTL DIVIDE BY 12 COUNTER | | SN74LS92N |
| U05 | 84832 | IC ECL 10/11 TWO-MODULUS PRESCALER | | MC12013P |
| U06 | 84890 | IC OP AMP GEN PUR +70C 8-PIN DIP 741C | | MC1741CP1 |
| W01 | 148756 | WIRING HARNESS IF LO INTERFACE | | |
| W01P1 | 82953 | CONN MISC BODY W/O INSERTS 10 HOLES | 00779 | 87133-5 |
| W02J1 | 85041 | CONN COAX CONHX SNAP-ON BHD MALE .15 CBL | | 51-127-0000 |
| W02P1 | 148757 | CABLE RF | | |
| W02P2 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W03 | 148758 | CABLE RF | | |
| W03J1 | 78600 | NOT ASSIGNED | | |
| W03J2 | 85041 | CONN COAX CONHX SNAP-ON BHD MALE .15 CBL | | 51-127-0000 |
| W03P1 | 78600 | NOT ASSIGNED | | |
| W03P2 | 78600 | NOT ASSIGNED | | |
| W03P3 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W04 | 148687 | CABLE RF | | |
| W04J1 | 78600 | NOT ASSIGNED | | |
| W04J2 | 78600 | NOT ASSIGNED | | |
| W04J3 | 85041 | CONN COAX CONHX SNAP-ON BHD MALE .15 CBL | | 51-127-0000 |
| W04P1 | 78600 | NOT ASSIGNED | | |
| W04P2 | 78600 | NOT ASSIGNED | | |
| W04P3 | 78600 | NOT ASSIGNED | | |
| W04P4 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |

MODULE ASSY IF CONVERTER

REF DESIG PREFIX A04

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 81637 | DIODE BD3 GER BACK DIODE | 24446 | SBD-572 |
| CR02 | 71143 | DIODE 1N4735A SI ZEN 6.2V 5% 1W | 04713 | 1N4735A |
| CR03 | 71121 | DIODE 1N821 TC REF 6.2V .01% .4W | 04713 | 1N821 |
| CR04 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| C01 | 81746 | CAPACITR 1 PF 500V CER DISC | 72982 | 831-COKO-109C |
| C02 | 81746 | CAPACITR 1 PF 500V CER DISC | 72982 | 831-COKO-109C |
| C03 | 82434 | CAPACITR 25 PF 100V CER DISC | 18796 | 835-024-COGO-250J |
| C04 | 82010 | CAPACITR 5.6 PF 100V CER DISC | 72982 | 835-024-COHO-569C |
| C05 | 82432 | CAPACITR 23 PF 100V CER DISC | 18796 | 835-024-COGO-230J |
| C06 | 81924 | CAPACITR 7 PF 500V CER DISC | 72982 | 831-COHO-709C |
| C07 | 82431 | CAPACITR 22 PF 100V CER DISC | 18796 | 835-024-COGO-220J |
| C08 | 82006 | CAPACITR 3.9 PF 100V CER DISC | 72982 | 835-024-COJO-399C |
| C09 | 82013 | CAPACITR 7.5 PF 100V CER DISC | 72982 | 835-024-COHO-759C |
| C10 | 79143 | CAPACITR 2-8 PF MIN CER DISC PC MT | 72982 | 538-011 A 2-8 |
| C11 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C12 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C13 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C14 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C15 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C16 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C17 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C18 | 81746 | CAPACITR 1 PF 500V CER DISC | 72982 | 831-COKO-109C |
| C19 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C20 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C21 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C22 | 70536 | CAPACITR 390 PF 500V SILVER MICA 5% | 14655 | CD15FD391J03 |
| C23 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C24 | 70536 | CAPACITR 390 PF 500V SILVER MICA 5% | 14655 | CD15FD391J03 |
| C25 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C26 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C27 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C28 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C29 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C30 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C31 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| C32 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| C33 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| C34 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T3628106K025AS |
| C35 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T3628106K025AS |
| C36 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C37 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C38 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C39 | 81827 | CAPACITR 160 PF 100V SILVER MICA 2% | 53021 | D151C161G03 |
| C40 | 81827 | CAPACITR 160 PF 100V SILVER MICA 2% | 53021 | D151C161G03 |
| C41 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C42 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C43 | 35760 | CAPACITR 4 PF 500V CER DISC | 72982 | 831-COHO-409C |
| C44 | 82014 | CAPACITR 8.2 PF 100V CER DISC | 72982 | 835-024-COHO-829C |
| C45 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C46 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C47 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C48 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C49 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C50 | 83258 | CAPACITR CHIP .1 MF 50V | | ULA555C104M |
| C51 | 79143 | CAPACITR 2-8 PF MIN CER DISC PC MT | 72982 | 538-011 A 2-8 |
| C52 | 79143 | CAPACITR 2-8 PF MIN CER DISC PC MT | 72982 | 538-011 A 2-8 |
| C53 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C54 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C55 | 83258 | CAPACITR CHIP .1 MF 50V | | ULA555C104M |
| C56 | 81125 | CAPACITR .25-1.5 PF TEFLON TRIMMER PC MT | 72982 | 530-000 |
| C57 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C58 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C59 | 81971 | CAPACITR 2.2 PF 100V CER DISC | 72982 | 835-024-COGO2298 |
| C60 | 78600 | NOT ASSIGNED | | |
| C61 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C62 | 81971 | CAPACITR 2.2 PF 100V CER DISC | 72982 | 835-024-COGO2298 |
| C63 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C64 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C65 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C66 | 81971 | CAPACITR 2.2 PF 100V CER DISC | 72982 | 835-024-COGO2298 |
| C67 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |

MODULE ASSY IF CONVERTER

REF DESIG PREFIX A04

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| C68 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C69 | 70492 | CAPACITR 33 PF 500V SILVER MICA 5% | 14655 | CD15ED330J03 |
| C70 | 81125 | CAPACITR .25-1.5 PF TEFLON TRIMMER PC MT | 72982 | 530-000 |
| C71 | 77512 | CAPACITR 24 PF 500V SILVER MICA 5% | 14655 | CD15ED240J03 |
| C72 | 81743 | CAPACITR 75 PF 500V SILVER MICA 5% | 14655 | CD15ED750J03 |
| C73 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C74 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C75 | 81971 | CAPACITR 2.2 PF 100V CER DISC | 72982 | 835-024-COG0229B |
| C76 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C77 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C78 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C79 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C80 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C81 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C82 | 81971 | CAPACITR 2.2 PF 100V CER DISC | 72982 | 835-024-COG0229B |
| C83 | 81971 | CAPACITR 2.2 PF 100V CER DISC | 72982 | 835-024-COG0229B |
| C84 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C85 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C86 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C87 | 70519 | CAPACITR 120 PF 500V SILVER MICA 5% | 14655 | CD15FD121J03 |
| C88 | 81926 | CAPACITR 10 PF 500V CER DISC | 72982 | 831-COHO-100C |
| C89 | 70498 | CAPACITR 47 PF 500V SILVER MICA 5% | 14655 | CD15ED470J03 |
| C90 | 81926 | CAPACITR 10 PF 500V CER DISC | 72982 | 831-COHO-100C |
| C91 | 82007 | CAPACITR 4.3 PF 100V CER DISC | 72982 | 835-024-COHO-439C |
| C92 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| C93 | 75417 | CAPACITR .01 MF 150V CER DISC | 71590 | DDM-103 |
| E01 | 81718 | CORE BEAD FERRITE 7D .138X.037X.150L | 78488 | 57-1413 |
| E02 | 81718 | CORE BEAD FERRITE 7D .138X.037X.150L | 78488 | 57-1413 |
| J01 | | NOT ASSIGNED | | |
| J02 | | NOT ASSIGNED | | |
| J03 | | NOT ASSIGNED | | |
| J04 | 84940 | CONN COAX CONHX SNAP-ON MALE PC MT | | 51-151-0000 |
| J05 | 78600 | NOT ASSIGNED | | |
| J06 | 84940 | CONN COAX CONHX SNAP-ON MALE PC MT | | 51-151-0000 |
| J07 | 84940 | CONN COAX CONHX SNAP-ON MALE PC MT | | 51-151-0000 |
| J08 | 84940 | CONN COAX CONHX SNAP-ON MALE PC MT | | 51-151-0000 |
| J09 | 84940 | CONN COAX CONHX SNAP-ON MALE PC MT | | 51-151-0000 |
| J10 | 84940 | CONN COAX CONHX SNAP-ON MALE PC MT | | 51-151-0000 |
| J11 | 81632 | JACK CONNECTOR .040 DIA | 71279 | 450-3704-01-01-01 |
| J12 | 81632 | JACK CONNECTOR .040 DIA | 71279 | 450-3704-01-01-01 |
| J13 | 81632 | JACK CONNECTOR .040 DIA | 71279 | 450-3704-01-01-01 |
| J14 | 81632 | JACK CONNECTOR .040 DIA | 71279 | 450-3704-01-01-01 |
| J15 | 81632 | JACK CONNECTOR .040 DIA | 71279 | 450-3704-01-01-01 |
| J16 | 81632 | JACK CONNECTOR .040 DIA | 71279 | 450-3704-01-01-01 |
| L01 | 149283 | INDUCTOR 3.5 T #20 1/4-28X3/8 IN. CARB J | | PER CONTROL DWG |
| L02 | 149283 | INDUCTOR 3.5 T #20 1/4-28X3/8 IN. CARB J | | PER CONTROL DWG |
| L03 | 149283 | INDUCTOR 3.5 T #20 1/4-28X3/8 IN. CARB J | | PER CONTROL DWG |
| L04 | 149283 | INDUCTOR 3.5 T #20 1/4-28X3/8 IN. CARB J | | PER CONTROL DWG |
| L05 | 78975 | INDUCTOR 15 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L06 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L07 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L08 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L09 | 78975 | INDUCTOR 15 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L10 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L11 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L12 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L13 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L14 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L15 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L16 | 145349 | INDUCTOR 9.5 T #24 6-32X3/8 INCH CARB J | 02113 | PER CONT. DWG. |
| L17 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L18 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L19 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L20 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L21 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L22 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L23 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L24 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |

MODULE ASSY IF CONVERTER

REF DESIG PREFIX A04

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| L25 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L26 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L27 | 145341 | INDUCTOR 1.5 T #24 6-32X3/8 INCH CARB J | 02113 | PER CONT. DWG. |
| L28 | 145342 | INDUCTOR 2.5 T #24 6-32X3/8 INCH CARB J | 02113 | PER CONT. DWG. |
| L29 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L30 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L31 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L32 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L33 | 145343 | INDUCTOR 3.5 T #24 6-32X3/8 INCH CARB J | 02113 | PER CONT. DWG. |
| L34 | 145348 | INDUCTOR 8.5 T #24 6-32X3/8 INCH CARB J | 02113 | PER CONT. DWG. |
| L35 | 82591 | INDUCTOR .39 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L36 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L37 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L38 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L39 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| P01 | | NOT ASSIGNED | | |
| P02 | | NOT ASSIGNED | | |
| P03 | | NOT ASSIGNED | | |
| P04 | | NOT ASSIGNED | | |
| P05 | 82455 | PLUG INSULATED JUMPER .20 SPACING | 71279 | 461-2871-01-00-10 |
| P06 | 82455 | PLUG INSULATED JUMPER .20 SPACING | 71279 | 461-2871-01-00-10 |
| Q01 | 84917 | TRANSSTR U311 FET N-CHNL JUNC | | U311 |
| Q02 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q03 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q04 | 77147 | TRANSSTR 2N3947 NPN SIL | 04713 | 2N3947 |
| Q05 | 77147 | TRANSSTR 2N3947 NPN SIL | 04713 | 2N3947 |
| Q06 | 85042 | TRANSSTR MRF 517 NPN SIL | | MRF 517 |
| Q07 | 85042 | TRANSSTR MRF 517 NPN SIL | | MRF 517 |
| Q08 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q09 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q10 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q11 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q12 | 85042 | TRANSSTR MRF 517 NPN SIL | | MRF 517 |
| Q13 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q14 | 35669 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| R01 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R02 | 71967 | RESISTOR 1.5K OHM 1/2W 10% COMP | 01121 | RCR20G152KS |
| R03 | 71918 | RESISTOR 330 OHM 1/4W 10% COMP | 01121 | RCR07G331KS |
| R04 | 71931 | RESISTOR 560 OHM 1/4W 10% COMP | 01121 | RCR07G561KS |
| R05 | 71913 | RESISTOR 270 OHM 1/4W 10% COMP | 01121 | RCR07G271KS |
| R06 | 71920 | RESISTOR 390 OHM 1/4W 10% COMP | 01121 | RCR07G391KS |
| R07 | 71853 | RESISTOR 27 OHM 1/4W 10% COMP | 01121 | RCR07G270KS |
| R08 | 71920 | RESISTOR 390 OHM 1/4W 10% COMP | 01121 | RCR07G391KS |
| R09 | 71862 | RESISTOR 47 OHM 1/4W 10% COMP | 01121 | RCR07G470KS |
| R10 | 71966 | RESISTOR 1.5K OHM 1/4W 10% COMP | 01121 | RCR07G152KS |
| R11 | 71897 | RESISTOR 150 OHM 1/4W 10% COMP | 01121 | RCR07G151KS |
| R12 | 71966 | RESISTOR 1.5K OHM 1/4W 10% COMP | 01121 | RCR07G152KS |
| R13 | 71966 | RESISTOR 1.5K OHM 1/4W 10% COMP | 01121 | RCR07G152KS |
| R14 | 71982 | RESISTOR 2.7K OHM 1/4W 10% COMP | 01121 | RCR07G272KS |
| R15 | | NOT ASSIGNED | | |
| R16 | 72054 | RESISTOR 22K OHM 1/4W 10% COMP | 01121 | RCR07G223KS |
| R17 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R18 | 72064 | RESISTOR 33K OHM 1/4W 10% COMP | 01121 | RCR07G333KS |
| R19 | 78722 | POT 5K OHM 1/2W CERMET PC MT 3/8 DIA | 01121 | SV5021 |
| R20 | 72019 | RESISTOR 8.2K OHM 1/4W 10% COMP | 01121 | RCR07G822KS |
| R21 | 72002 | RESISTOR 4.7K OHM 1/4W 10% COMP | 01121 | RCR07G472KS |
| R22 | 72002 | RESISTOR 4.7K OHM 1/4W 10% COMP | 01121 | RCR07G472KS |
| R23 | 71951 | RESISTOR 1.0K OHM 1/4W 10% COMP | 01121 | RCR07G102KS |
| R24 | 71897 | RESISTOR 150 OHM 1/4W 10% COMP | 01121 | RCR07G151KS |
| R25 | 71897 | RESISTOR 150 OHM 1/4W 10% COMP | 01121 | RCR07G151KS |
| R26 | 71960 | RESISTOR 1.2K OHM 1/4W 10% COMP | 01121 | RCR07G122KS |
| R27 | 71926 | RESISTOR 470 OHM 1/4W 10% COMP | 01121 | RCR07G471KS |
| R28 | 71862 | RESISTOR 47 OHM 1/4W 10% COMP | 01121 | RCR07G470KS |
| R29 | 71941 | RESISTOR 820 OHM 1/4W 10% COMP | 01121 | RCR07G821KS |
| R30 | 71918 | RESISTOR 330 OHM 1/4W 10% COMP | 01121 | RCR07G331KS |
| R31 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R32 | 71873 | RESISTOR 56 OHM 1/4W 10% COMP | 01121 | RCR07G560KS |
| R33 | 78957 | POT 500 OHM 1/2W CERMET PC MT 3/8 DIA | 01121 | SV5011 |

MODULE ASSY IF CONVERTER

REF DESIG PREFIX A04

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| R34 | 71939 | RESISTOR 680 OHM 1/2W 10% COMP | 01121 | RCR20G681KS |
| R35 | 83089 | RESISTOR 75.0 OHM RN55C 1% MTL FLM | | RN55C75R0F |
| R36 | 71914 | RESISTOR 270 OHM 1/2W 10% COMP | 01121 | RCR20G271KS |
| R37 | 71921 | RESISTOR 390 OHM 1/2W 10% COMP | 01121 | RCR20G391KS |
| R38 | 71954 | RESISTOR 1.0K OHM 1/2W 10% COMP | 01121 | RCR20G102KS |
| R39 | 71914 | RESISTOR 270 OHM 1/2W 10% COMP | 01121 | RCR20G271KS |
| R40 | 71862 | RESISTOR 47 OHM 1/4W 10% COMP | 01121 | RCR07G470KS |
| R41 | 71907 | RESISTOR 220 OHM 1/4W 10% COMP | 01121 | RCR07G221KS |
| R42 | 71889 | RESISTOR 100 OHM 1/2W 10% COMP | 01121 | RCR20G101KS |
| R43 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R44 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R45 | 71931 | RESISTOR 560 OHM 1/4W 10% COMP | 01121 | RCR07G561KS |
| R46 | 71913 | RESISTOR 270 OHM 1/4W 10% COMP | 01121 | RCR07G271KS |
| R47 | 71894 | RESISTOR 120 OHM 1/4W 10% COMP | 01121 | RCR07G121KS |
| R48 | 71920 | RESISTOR 390 OHM 1/4W 10% COMP | 01121 | RCR07G391KS |
| R49 | 71862 | RESISTOR 47 OHM 1/4W 10% COMP | 01121 | RCR07G470KS |
| R50 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R51 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R52 | 71913 | RESISTOR 270 OHM 1/4W 10% COMP | 01121 | RCR07G271KS |
| R53 | 71894 | RESISTOR 120 OHM 1/4W 10% COMP | 01121 | RCR07G121KS |
| R54 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R55 | 71931 | RESISTOR 560 OHM 1/4W 10% COMP | 01121 | RCR07G561KS |
| R56 | 71862 | RESISTOR 47 OHM 1/4W 10% COMP | 01121 | RCR07G470KS |
| R57 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R58 | 71920 | RESISTOR 390 OHM 1/4W 10% COMP | 01121 | RCR07G391KS |
| R59 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R60 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R61 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R62 | 71862 | RESISTOR 47 OHM 1/4W 10% COMP | 01121 | RCR07G470KS |
| R63 | 71913 | RESISTOR 270 OHM 1/4W 10% COMP | 01121 | RCR07G271KS |
| R64 | 71913 | RESISTOR 270 OHM 1/4W 10% COMP | 01121 | RCR07G271KS |
| R65 | 71897 | RESISTOR 150 OHM 1/4W 10% COMP | 01121 | RCR07G151KS |
| R66 | 71901 | RESISTOR 180 OHM 1/4W 10% COMP | 01121 | RCR07G181KS |
| R67 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| R68 | 71951 | RESISTOR 1.0K OHM 1/4W 10% COMP | 01121 | RCR07G102KS |
| R69 | 74702 | RESISTOR 1.0K OHM 1/4W 5% COMP | 01121 | RCR07G102JS |
| R70 | 74724 | RESISTOR 6.8K OHM 1/4W 5% COMP | 01121 | RCR07G682JS |
| R71 | 74700 | RESISTOR 820 OHM 1/4W 5% COMP | 01121 | RCR07G821JS |
| R72 | 75663 | RESISTOR 4.3K OHM 1/4W 5% COMP | 01121 | RCR07G432JS |
| U01 | 81840 | IC OP AMP 8PIN DIP INT.COMP. DUAL 741C | 04713 | MC1458P1 |
| W01 | 148680 | WIRING HARNESS IF CONVERTER INTERFACE | | |
| W01P1 | 82953 | CONN MISC BODY W/O INSERTS 10 HOLES | 00779 | 87133-5 |
| W02 | 148681 | CABLE RF | | |
| W02J1 | 85041 | CONN COAX CONHX SNAP-ON BHD MALE .15 CBL | | 51-127-0000 |
| W02P2 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W03 | 148682 | CABLE RF | | |
| W03J2 | 85041 | CONN COAX CONHX SNAP-ON BHD MALE .15 CBL | | 51-127-0000 |
| W03P4 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W04 | 148683 | CABLE RF | | |
| W04J3 | 85041 | CONN COAX CONHX SNAP-ON BHD MALE .15 CBL | | 51-127-0000 |
| W04P3 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| Y01 | 146550 | CRYSTAL 120.00 MHZ +-20 PPM SERIES MODE | | PER CONTROL DWG |
| Z01 | 146551 | MIXER DOUBLE-BALANCED PC MT | | PER CONTROL DWG |
| Z02 | 146551 | MIXER DOUBLE-BALANCED PC MT | | PER CONTROL DWG |

# MODEL 4670
# RF BASEBAND ANALYZER

IF/BASEBAND ANALYZER ASSY. MODEL 4670-1

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| A01 | 147753 | CARD CAGE ASSY | | |
| A02 | 147607 | 30 KHZ IF MODULE ASSY | | |
| A03 | 147610 | MODULE ASSY IF LO | | |
| A04 | 147621 | MODULE ASSY IF CONVERTER | | |
| A05 | 147622 | BASEBAND CONVERTER MODULE ASSY | | |
| A06 | 147620 | 302 KHZ IF MODULE ASSY | | |
| A07 | 148748 | PWR ASSY, LAMP LOGIC | | |
| A08 | 147661 | REAR PNL, IF/BB ANALYZR MDL 4670-1, ASSY | | |
| A09 | 147667 | FRONT PNL,IF/BB ANALYZR MDL 4670-1, ASSY | | |
| A10 | 147547 | DE-EMPHASIS NETWORK MODULE ASSY | | |
| A11 | 147739 | ATTENUATOR LOGIC PWR ASSY | | |
| A12 | 148751 | PWR ASSY, DISPLAY INTERFACE | | |
| A13 | 147623 | BASEBAND LOCAL OSCILLATOR MODULE ASSY | | |
| A14 | 147547 | ATTENUATOR MODULE | | |

CARD CAGE ASSY.

REF DESIG PREFIX A01

| COMP DESIG | S-A PART NO | ----------DESCRIPTION---------- | FSCM | -----MFR PART NO----- |
|---|---|---|---|---|
| A01 | 147685 | A/D ARITHMETIC PWB ASSY | | |
| A02 | 147691 | COUNTER PWB ASSY | | |
| A03 | 147697 | AUTO-RANGE AND LOG AMPLIFIER ASSY | | |
| A04 | 147727 | SWEEP GENERATOR AND MODE LOGIC PWB ASSY | | |
| A05 | 147709 | SCAN CONTROL PWB ASSY | | |
| A06 | 147721 | METER AND RECORDER INTERFACE PWB ASSY | | |
| A07 | 147733 | 9-VOLT REGULATORS PWB ASSY | | |
| A08 | 147555 | PWB ASSY CARD EXTENDER | | |
| A09 | 147550 | POWER SUPPLY PWB ASSY | | |
| A10 | 147703 | MOTHER BOARD, CARD CAGE ASSY | | |
| A99 | 148672 | PWB ASSY PROM A/D PROCESSOR -TEMPORARY | | |

A/D ARITHMETIC PWB. ASSY.

REF DESIG PREFIX A01A01

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 76523 | DIODE 1N4372A SI ZEN 3.0V 5% .4W | 04713 | 1N4372A |
| CR02 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| C01 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C02 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C03 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C04 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C05 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C06 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C07 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C08 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C09 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C10 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C11 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C12 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C13 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C14 | 81591 | CAPACITR 22 MF 35V SOLID TANT POL 20% | 80183 | CS13BF226K |
| C15 | 70556 | CAPACITR .003 MF 1KV CER DISC | 71590 | DD302 |
| C16 | 35760 | CAPACITR 4 PF 500V CER DISC | 72982 | 831-COH0-409C |
| C17 | 35760 | CAPACITR 4 PF 500V CER DISC | 72982 | 831-COH0-409C |
| C18 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C19 | 35653 | CAPACITR 1.0 MF 35V SOLID TANT POL 20% | 05397 | T362A105M035AS |
| C20 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C21 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C22 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C23 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C24 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| J01 | 85126 | CONN HEADER DBL ROW STRAIGHT 10-PIN PC | | 87227-5 |
| R01 | 82390 | RESISTOR 620 OHM 1/4W 5% COMP | 01121 | RCR07G621JS |
| R02 | 71897 | RESISTOR 150 OHM 1/4W 10% COMP | 01121 | RCR07G151KS |
| R03 | 71992 | RESISTOR 2.7K OHM 1/4W 10% COMP | 01121 | RCR07G272KS |
| R04 | 71876 | RESISTOR 68 OHM 1/4W 10% COMP | 01121 | RCR07G680KS |
| R05 | 71993 | RESISTOR 3.9K OHM 1/4W 10% COMP | 01121 | RCR07G392KS |
| R06 | 77598 | POT 10K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR10K |
| R07 | 78137 | POT 2K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR2K |
| R08 | 78332 | RESISTOR 1.50K OHM RN60C 1% MTL FLM | | RN60C1501F |
| R09 | 82121 | RESISTOR 7.15K OHM RN60C 1% MTL FLM | | RN60C7151F |
| R10 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R11 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R12 | 82138 | RESISTOR 24.9K OHM RN60C 1% MTL FLM | | RN60C2492F |
| R13 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R14 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R15 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R16 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R17 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R18 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R19 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R20 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R21 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R22 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R23 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R24 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R25 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R26 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R27 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R28 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R29 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R30 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R31 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R32 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R33 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R34 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| U01 | 85037 | IC MICRO CLOCK GENERATOR | | 4201 |
| U02 | 85038 | IC 4-BIT MICROPROCESSOR | | 4004 |
| U03 | 147588 | ROM MASK PROGRAMMED SPEC CONTROL DWG | | |
| U04 | 85036 | IC CMOS 3 1/2 DIGIT A/D LOGIC SUBSYSTEM | | MC14435VP |

A/D ARITHMETIC PWB. ASSY.

REF DESIG PREFIX A01A01

| COMP DESIG | S-A PART NO | DESCRIPTION | | FSCM | MFR PART NO |
|---|---|---|---|---|---|
| U05 | 85035 | IC DUAL RAMP A/D CONVERTER SUBSYSTEM | | | MC1405L |
| U06 | 84687 | IC CMOS 8-IN DATA SELECTOR | | | MC14512CP |
| U07 | 84686 | IC CMOS DUAL 4-IN MULTIPLEXER | | | MC14539CP |
| U08 | 84686 | IC CMOS DUAL 4-IN MULTIPLEXER | | | MC14539CP |
| U09 | 84890 | IC OP AMP GEN PUR +70C 8-PIN DIP | 741C | | MC1741CP1 |
| U10 | 83016 | IC CMOS QUAD 2-IN NAND GATE | | 04713 | MC14011CP |
| U11 | 85034 | IC VOLTAGE RGLTR NEG 8 VOLTS | | | LM320T-8.0 |
| | | | | | |
| Y01 | 35640 | CRYSTAL 4.70 MHZ LOW FREQ | | 94149 | BY SA DWG 35640 |

COUNTER PWR. ASSY.

REF DESIG PREFIX A01A02

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| C01 | 70518 | CAPACITR 100 PF 1KV CER DISC | 71590 | DD-101 |
| C02 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C03 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C04 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C05 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C06 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| R01 | 72002 | RESISTOR 4.7K OHM 1/4W 10% COMP | 01121 | RCR07G472KS |
| R02 | 72002 | RESISTOR 4.7K OHM 1/4W 10% COMP | 01121 | RCR07G472KS |
| R03 | 72002 | RESISTOR 4.7K OHM 1/4W 10% COMP | 01121 | RCR07G472KS |
| R04 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| R05 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| R06 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| R07 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| U01 | 83062 | IC CMOS TRIPLE 3-IN NOR GATE | 04713 | MC14025CP |
| U02 | 83016 | IC CMOS QUAD 2-IN NAND GATE | 04713 | MC14011CP |
| U03 | 83060 | IC CMOS DUAL 4-BIT SHIFT REGISTER | 04713 | MC14015CP |
| U04 | 83350 | IC CMOS DUAL BCD UP COUNTER | 04713 | MC14518CP |
| U05 | 83350 | IC CMOS DUAL BCD UP COUNTER | 04713 | MC14518CP |
| U06 | 83350 | IC CMOS DUAL BCD UP COUNTER | 04713 | MC14518CP |
| U07 | 83011 | IC CMOS DUAL TYPE D FLIP-FLOP | 04713 | MC14013CP |
| U08 | 94279 | IC TTL QUAD 2-IN NAND GATE | 01295 | SN74LS00N |
| U09 | 84032 | IC TTL DECADE COUNTER | 01295 | SN74LS90N |
| U10 | 83350 | IC CMOS DUAL BCD UP COUNTER | 04713 | MC14518CP |
| U11 | 83008 | IC CMOS BCD UP DOWN COUNTER | 04713 | MC14510CP |
| U12 | 84145 | IC CMOS QUAD 2-IN OR GATE +85C | 04713 | MC14071CP |
| U13 | 84174 | IC CMOS DUAL 4-IN OR GATE | 79089 | CD4072BE |
| U14 | 84174 | IC CMOS DUAL 4-IN OR GATE | 79089 | CD4072BE |
| U15 | 83351 | IC CMOS 8-BIT STATIC SHIFT REGISTER | 04713 | MC14021CP |
| U16 | 83351 | IC CMOS 8-BIT STATIC SHIFT REGISTER | 04713 | MC14021CP |
| U17 | 83351 | IC CMOS 8-BIT STATIC SHIFT REGISTER | 04713 | MC14021CP |
| U18 | 83351 | IC CMOS 8-BIT STATIC SHIFT REGISTER | 04713 | MC14021CP |
| U19 | 83351 | IC CMOS 8-BIT STATIC SHIFT REGISTER | 04713 | MC14021CP |
| U20 | 83016 | IC CMOS QUAD 2-IN NAND GATE | 04713 | MC14011CP |
| U21 | 83016 | IC CMOS QUAD 2-IN NAND GATE | 04713 | MC14011CP |
| U22 | 83350 | IC CMOS DUAL BCD UP COUNTER | 04713 | MC14518CP |
| U23 | 83016 | IC CMOS QUAD 2-IN NAND GATE | 04713 | MC14011CP |
| U24 | 84032 | IC TTL DECADE COUNTER | 01295 | SN74LS90N |
| U25 | 84283 | IC TTL DUAL D-TYPE FLIP-FLOP | 01295 | SN74LS74N |

AUTO-RANGE AND LOG AMP ASSY

REF DESIG PREFIX A01A03

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| A01 | 84952 | CONVERTER TRUE RMS-TO-DC | | 4341 |
| CR01 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR02 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR03 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR04 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR05 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR06 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR07 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR08 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR09 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR10 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR11 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR12 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR13 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR14 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| C01 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C02 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C03 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C04 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C05 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C06 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C07 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C08 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C09 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C10 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C11 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C12 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C13 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C14 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C15 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C16 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C17 | 77256 | CAPACITR 470 PF 100V SILVER MICA 5% | 14655 | CD7FA471J03 |
| C18 | 75193 | CAPACITR .001 MF 500V SILVER MICA 5% | 14655 | CD19FD102J03 |
| C19 | 77256 | CAPACITR 470 PF 100V SILVER MICA 5% | 14655 | CD7FA471J03 |
| C20 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C21 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C22 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C23 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C24 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C25 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C26 | | NOT ASSIGNED | | |
| C27 | 70517 | CAPACITR 100 PF 500V SILVER MICA 5% | 14655 | CD15FD101J03 |
| C28 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C29 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C30 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C31 | 76469 | CAPACITR 10 PF 500V SILVER MICA 5% | 84171 | DM10-100J |
| C32 | 76469 | CAPACITR 10 PF 500V SILVER MICA 5% | 84171 | DM10-100J |
| C33 | 81995 | CAPACITR .001 MF 100V CER MONO X7R 10% | 72982 | 8121-100-X7R-102K |
| L01 | 85053 | INDUCTOR 22 MH MIN SHLD ENCAP 10% | | SWD22000 |
| L02 | 85053 | INDUCTOR 22 MH MIN SHLD ENCAP 10% | | SWD22000 |
| R01 | 78906 | RESISTOR 4.99K OHM RN60C 1% MTL FLM | | RN60C4991F |
| R02 | 78906 | RESISTOR 4.99K OHM RN60C 1% MTL FLM | | RN60C4991F |
| R03 | 78906 | RESISTOR 4.99K OHM RN60C 1% MTL FLM | | RN60C4991F |
| R04 | 78906 | RESISTOR 4.99K OHM RN60C 1% MTL FLM | | RN60C4991F |
| R05 | 78137 | POT 2K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR2K |
| R06 | 82119 | RESISTOR 6.49K OHM RN60C 1% MTL FLM | | RN60C6491F |
| R07 | 77597 | POT 5K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR5K |
| R08 | 81218 | RESISTOR 20.5K OHM RN60C 1% MTL FLM | | RN60C2052F |
| R09 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R10 | 72019 | RESISTOR 8.2K OHM 1/4W 10% COMP | 01121 | RCR07G822KS |
| R11 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R12 | 78137 | POT 2K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR2K |
| R13 | 82119 | RESISTOR 6.49K OHM RN60C 1% MTL FLM | | RN60C6491F |
| R14 | 77597 | POT 5K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR5K |
| R15 | 81218 | RESISTOR 20.5K OHM RN60C 1% MTL FLM | | RN60C2052F |

AUTO-RANGE AND LOG AMP ASSY

REF DESIG PREFIX A01A03

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| R16 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R17 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R18 | 78137 | POT 2K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR2K |
| R19 | 82116 | RESISTOR 6.49K OHM RN60C 1% MTL FLM | | RN60C6491F |
| R20 | 77597 | POT 5K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR5K |
| R21 | 81218 | RESISTOR 20.5K OHM RN60C 1% MTL FLM | | RN60C2052F |
| R22 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R23 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R24 | 78906 | RESISTOR 4.99K OHM RN60C 1% MTL FLM | | RN60C4991F |
| R25 | 77598 | POT 10K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR10K |
| R26 | 72214 | RESISTOR 4.7 MEG 1/4W 10% COMP | 01121 | RCR07G475KS |
| R27 | | NOT ASSIGNED | | |
| R28 | | NOT ASSIGNED | | |
| R29 | 72214 | RESISTOR 4.7 MEG 1/4W 10% COMP | 01121 | RCR07G475KS |
| R30 | | NOT ASSIGNED | | |
| R31 | 77598 | POT 10K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR10K |
| R32 | | NOT ASSIGNED | | |
| R33 | 78906 | RESISTOR 4.99K OHM RN60C 1% MTL FLM | | RN60C4991F |
| R34 | 78906 | RESISTOR 4.99K OHM RN60C 1% MTL FLM | | RN60C4991F |
| R35 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R36 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R37 | 78579 | RESISTOR 75.0K OHM RN60C 1% MTL FLM | | RN60C7502F |
| R38 | 77598 | POT 10K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR10K |
| R39 | 71977 | RESISTOR 2.2K OHM 1/4W 10% COMP | 01121 | RCR07G222KS |
| R40 | 78243 | RESISTOR 40.2K OHM RN60C 1% MTL FLM | | RN60C4022F |
| R41 | 77598 | POT 10K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR10K |
| R42 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R43 | 78248 | RESISTOR 1.00K OHM RN60C 1% MTL FLM | | RN60C1001F |
| R44 | 84956 | RESISTOR 39.2K OHM RN60C 1% MTL FLM | | RN60C3922F |
| R45 | 77598 | POT 10K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR10K |
| R46 | 78248 | RESISTOR 1.00K OHM RN60C 1% MTL FLM | | RN60C1001F |
| R47 | 80240 | RESISTOR 22.6K OHM RN60C 1% MTL FLM | | RN60C2262F |
| R48 | 77597 | POT 5K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR5K |
| R49 | 82124 | RESISTOR 9.09K OHM RN60C 1% MTL FLM | | RN60C9091F |
| R50 | 78137 | POT 2K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR2K |
| R51 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R52 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R53 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R54 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R55 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R56 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R57 | 82109 | RESISTOR 2.61K OHM RN60C 1% MTL FLM | | RN60C2611F |
| R58 | 82124 | RESISTOR 9.09K OHM RN60C 1% MTL FLM | | RN60C9091F |
| R59 | 78137 | POT 2K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR2K |
| R60 | 78246 | RESISTOR 10.0K OHM RN60C 1% MTL FLM | | RN60C1002F |
| R61 | 78137 | POT 2K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR2K |
| R62 | 80935 | RESISTOR 61.9K OHM RN60C 1% MTL FLM | | RN60C6192F |
| R63 | 78383 | RESISTOR 56.2K OHM RN60C 1% MTL FLM | | RN60C5622F |
| R64 | 80237 | RESISTOR 4.02K OHM RN60C 1% MTL FLM | | RN60C4021F |
| R65 | 78906 | RESISTOR 4.99K OHM RN60C 1% MTL FLM | | RN60C4991F |
| R66 | 78571 | RESISTOR 2.21K OHM RN60D 1% MTL FLM | | RN60D2211F |
| R67 | 78898 | RESISTOR 2.49K OHM RN60C 1% MTL FLM | | RN60C2491F |
| R68 | 78577 | RESISTOR 20.0K OHM RN60C 1% MTL FLM | | RN60C2002F |
| R69 | 78571 | RESISTOR 2.21K OHM RN60D 1% MTL FLM | | RN60D2211F |
| R70 | 72207 | RESISTOR 2.2 MEG 1/4W 10% COMP | 01121 | RCR07G225KS |
| R71 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R72 | 78571 | RESISTOR 2.21K OHM RN60D 1% MTL FLM | | RN60D2211F |
| R73 | 78456 | RESISTOR 60.4K OHM RN60D 1% MTL FLM | | RN60D6042F |
| R74 | 78571 | RESISTOR 2.21K OHM RN60D 1% MTL FLM | | RN60D2211F |
| R75 | 72207 | RESISTOR 2.2 MEG 1/4W 10% COMP | 01121 | RCR07G225KS |
| R76 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R77 | 78571 | RESISTOR 2.21K OHM RN60D 1% MTL FLM | | RN60D2211F |
| R78 | 78578 | RESISTOR 36.5K OHM RN60C 1% MTL FLM | | RN60C3652F |
| R79 | 78571 | RESISTOR 2.21K OHM RN60D 1% MTL FLM | | RN60D2211F |
| R80 | 72207 | RESISTOR 2.2 MEG 1/4W 10% COMP | 01121 | RCR07G225KS |
| R81 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R82 | 78571 | RESISTOR 2.21K OHM RN60D 1% MTL FLM | | RN60D2211F |
| R83 | 82156 | RESISTOR 127K OHM RN60C 1% MTL FLM | | RN60C1273F |
| R84 | 82107 | RESISTOR 2.26K OHM RN60C 1% MTL FLM | | RN60C2261F |
| R85 | 72207 | RESISTOR 2.2 MEG 1/4W 10% COMP | 01121 | RCR07G225KS |
| R86 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R87 | 72002 | RESISTOR 4.7K OHM 1/4W 10% COMP | 01121 | RCR07G472KS |
| R88 | 72002 | RESISTOR 4.7K OHM 1/4W 10% COMP | 01121 | RCR07G472KS |
| R89 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |

AUTO-RANGE AND LOG AMP ASSY

REF DESIG PREFIX A01A03

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| R90 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R91 | | NOT ASSIGNED | | |
| R92 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| R93 | 78243 | RESISTOR 40.2K OHM RN60C 1% MTL FLM | | RN60C4022F |
| R94 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| R95 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| U01 | 84886 | IC OP AMP WIDEBAND 8-PIN DIP | | LM318N |
| U02 | 84291 | IC CMOS TRIPLE 2-IN ANALOG MUX/DEMUX | 79089 | CD4053AE |
| U03 | 84886 | IC OP AMP WIDEBAND 8-PIN DIP | | LM318N |
| U04 | 84291 | IC CMOS TRIPLE 2-IN ANALOG MUX/DEMUX | 79089 | CD4053AE |
| U05 | 84886 | IC OP AMP WIDEBAND 8-PIN DIP | | LM318N |
| U06 | 84291 | IC CMOS TRIPLE 2-IN ANALOG MUX/DEMUX | 79089 | CD4053AE |
| U07 | 84886 | IC OP AMP WIDEBAND 8-PIN DIP | | LM318N |
| U08 | 84145 | IC CMOS QUAD 2-IN OR GATE +85C | 04713 | MC14071CP |
| U09 | 83622 | IC CMOS QUAD 2-IN AND GATE | 04713 | MC14081CP |
| U10 | 83017 | IC CMOS QUAD 2-IN NOR GATE | 04713 | MC14001CP |
| U11 | 78219 | IC TEMP CONT DIFF PAIR 726C EC | 13715 | 726 HC |
| U12 | 82478 | IC OP AMP LOW NOISE 7 MHZ TO-5 INT.COMP | 04713 | MC1456G |
| U13 | 81940 | IC OP AMP 8PIN DIP INT.COMP. DUAL 741C | 04713 | MC1458P1 |
| U14 | 83013 | IC CMOS HEX BUFFER | 04713 | MC14050CP |
| U15 | 78077 | IC OP AMP GEN.PUR.TO-5 INT.COMP+70C 741C | 04713 | MC1741CG |
| U16 | 83240 | IC QUAD DIFF COMPARATOR | 12040 | LM339N |
| U17 | 83017 | IC CMOS QUAD 2-IN NOR GATE | 04713 | MC14001CP |
| U18 | 83017 | IC CMOS QUAD 2-IN NOR GATE | 04713 | MC14001CP |
| U19 | 84957 | IC CMOS 8-BIT UNIVERSAL BUS REGISTER | | MC14034CP |
| U20 | 83623 | IC CMOS DUAL MONOSTABLE MULTI | 04713 | MC14528CP |
| U21 | 84958 | IC CMOS QUAD BILATERAL SWITCH | | CD4066AE |

## SWEEP GENERATOR AND MODE LOGIC PWB. ASSY.

### REF DESIG PREFIX A01A04

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 78696 | DIODE 1N746A SI ZEN 3.3V 5% .4W | 01295 | 1N746A |
| CR02 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR03 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR04 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR05 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR06 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR07 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR08 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR09 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR10 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR11 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR12 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR13 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR14 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR15 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR16 | 71110 | DIODE 1N277 GER 100V 75MA | 80368 | 1N277 |
| CR17 | 71110 | DIODE 1N277 GER 100V 75MA | 80368 | 1N277 |
| CR18 | | NOT ASSIGNED | | |
| CR19 | | NOT ASSIGNED | | |
| CR20 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR21 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| C01 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C02 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C03 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C04 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C05 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C06 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C07 | 81591 | CAPACITR 22 MF 35V SOLID TANT POL 20% | 80183 | CS13BF226K |
| C08 | 70613 | CAPACITR 1 MF 200V MET MYLAR CVAL 10% | 84411 | X663F |
| C09 | 70544 | CAPACITR .001 MF 1KV CER DISC | 71590 | DD102 |
| C10 | 81591 | CAPACITR 22 MF 35V SOLID TANT POL 20% | 80183 | CS13BF226K |
| C11 | 77713 | CAPACITR .005 MF 50V CER DISC | 71590 | CK-502 |
| C12 | 81995 | CAPACITR .001 MF 100V CER MONO X7R 10% | 72982 | 8121-100-X7R-102K |
| Q01 | 77147 | TRANSSTR 2N3947 NPN SIL | 04713 | 2N3947 |
| Q02 | 73140 | TRANSSTR 2N2270 NPN SIL | 79089 | 2N2270 |
| Q03 | 79660 | TRANSSTR 2N4093 FET N-CHNL JUNC | 04713 | 2N4093 |
| Q04 | 77147 | TRANSSTR 2N3947 NPN SIL | 04713 | 2N3947 |
| Q05 | 83033 | TRANSSTR 2N2907A PNP SIL | | 2N2907A |
| R01 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R02 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R03 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R04 | 78247 | RESISTOR 4.53K OHM RN60D 1% MTL FLM | | RN60D4531F |
| R05 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R06 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R07 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R08 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R09 | 72123 | RESISTOR 150K OHM 1/4W 10% COMP | 01121 | RCR07G154KS |
| R10 | 72064 | RESISTOR 33K OHM 1/4W 10% COMP | 01121 | RCR07G333KS |
| R11 | 72165 | RESISTOR 470K OHM 1/4W 10% COMP | 01121 | RCR07G474KS |
| R12 | 82138 | RESISTOR 24.9K OHM RN60C 1% MTL FLM | | RN60C2492F |
| R13 | 82128 | RESISTOR 12.1K OHM RN60C 1% MTL FLM | | RN60C1212F |
| R14 | 82138 | RESISTOR 24.9K OHM RN60C 1% MTL FLM | | RN60C2492F |
| R15 | 82138 | RESISTOR 24.9K OHM RN60C 1% MTL FLM | | RN60C2492F |
| R16 | 78906 | RESISTOR 4.99K OHM RN60C 1% MTL FLM | | RN60C4991F |
| R17 | 81220 | RESISTOR 59.0K OHM RN60C 1% MTL FLM | | RN60C5902F |
| R18 | 72014 | RESISTOR 6.8K OHM 1/4W 10% COMP | 01121 | RCR07G682KS |
| R19 | 80213 | RESISTOR 100K OHM RN60C 1% MTL FLM | | RN60C1003F |
| R20 | 80213 | RESISTOR 100K OHM RN60C 1% MTL FLM | | RN60C1003F |
| R21 | | NOT ASSIGNED | | |
| R22 | 78239 | RESISTOR 49.9K OHM RN60C 1% MTL FLM | | RN60C4992F |
| R23 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R24 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R25 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R26 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R27 | 72054 | RESISTOR 22K OHM 1/4W 10% COMP | 01121 | RCR07G223KS |
| R28 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R29 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |

SWEEP GENERATOR AND MODE LOGIC PWB. ASSY.

REF DESIG PREFIX A01A04

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| R30 | 71982 | RESISTOR 2.7K OHM 1/4W 10% COMP | 01121 | RCR07G272KS |
| R31 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| R32 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| R33 | 76958 | POT 100K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR100K |
| R34 | 82157 | RESISTOR 133K OHM RN60C 1% MTL FLM | | RN60C1333F |
| R35 | 76958 | POT 100K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR100K |
| R36 | 82167 | RESISTOR 261K OHM RN60C 1% MTL FLM | | RN60C2613F |
| R37 | 78705 | POT 500K OHM 3/4W CERMET 20T PC MT | 80294 | 3009P-1-504 |
| R38 | 82177 | RESISTOR 487K OHM RN60C 1% MTL FLM | | RN60C4873F |
| R39 | 78238 | RESISTOR 499 OHM RN60C 1% MTL FLM | | RN60C4990F |
| R40 | 72014 | RESISTOR 6.8K OHM 1/4W 10% COMP | 01121 | RCR07G682KS |
| R41 | 82175 | RESISTOR 422K OHM RN60C 1% MTL FLM | | RN60C4223F |
| R42 | 77598 | POT 10K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR10K |
| R43 | 78246 | RESISTOR 10.0K OHM RN60C 1% MTL FLM | | RN60C1002F |
| R44 | 76956 | POT 1K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR1K |
| R45 | 82123 | RESISTOR 8.66K OHM RN60C 1% MTL FLM | | RN60C8661F |
| R46 | 82123 | RESISTOR 8.66K OHM RN60C 1% MTL FLM | | RN60C8661F |
| R47 | 78461 | RESISTOR 100 OHM RN60C 1% MTL FLM | | RN60C1000F |
| R48 | 77598 | POT 10K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR10K |
| R49 | 82123 | RESISTOR 8.66K OHM RN60C 1% MTL FLM | | RN60C8661F |
| R50 | 78461 | RESISTOR 100 OHM RN60C 1% MTL FLM | | RN60C1000F |
| R51 | 78246 | RESISTOR 10.0K OHM RN60C 1% MTL FLM | | RN60C1002F |
| R52 | 78906 | RESISTOR 4.99K OHM RN60C 1% MTL FLM | | RN60C4991F |
| R53 | 72207 | RESISTOR 2.2 MEG 1/4W 10% COMP | 01121 | RCR07G225KS |
| R54 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R55 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R56 | 72214 | RESISTOR 4.7 MEG 1/4W 10% COMP | 01121 | RCR07G475KS |
| R57 | 71960 | RESISTOR 1.2K OHM 1/4W 10% COMP | 01121 | RCR07G122KS |
| R58 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| U01 | 83017 | IC CMOS QUAD 2-IN NOR GATE | 04713 | MC14001CP |
| U02 | 83016 | IC CMOS QUAD 2-IN NAND GATE | 04713 | MC14011CP |
| U03 | 83622 | IC CMOS QUAD 2-IN AND GATE | 04713 | MC14081CP |
| U04 | 83622 | IC CMOS QUAD 2-IN AND GATE | 04713 | MC14081CP |
| U05 | 83011 | IC CMOS DUAL TYPE D FLIP-FLOP | 04713 | MC14013CP |
| U06 | 83623 | IC CMOS DUAL MONOSTABLE MULTI | 04713 | MC14528CP |
| U07 | 84958 | IC CMOS QUAD BILATERAL SWITCH | | CD4066AE |
| U08 | 81901 | IC OP AMP FET INPUT TC-5 INT.COMP-25+85C | 12040 | LH0042CH |
| U09 | 84958 | IC CMOS QUAD BILATERAL SWITCH | | CD4066AE |
| U10 | 81840 | IC OP AMP 8PIN DIP INT.COMP. DUAL 741C | 04713 | MC1458P1 |
| U11 | 83240 | IC QUAD DIFF COMPARATOR | 12040 | LM339N |

SCAN CONTROL PWB ASSY

REF DESIG PREFIX A01A05

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR02 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR03 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR04 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR05 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR06 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR07 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR08 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR09 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR10 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR11 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR12 | 76705 | DIODE 1N4733A SI ZEN 5.1V 5% 1W | 04713 | 1N4733A |
| C01 | 75193 | CAPACITR .001 MF 500V SILVER MICA 5% | 14655 | CD19FD102J03 |
| C02 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C03 | 75193 | CAPACITR .001 MF 500V SILVER MICA 5% | 14655 | CD19FD102J03 |
| C04 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C05 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C06 | 80039 | CAPACITR 10 MF 20V SOLID TANT POL 10% | | CS13BE 106K |
| C07 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C08 | 70525 | CAPACITR 150 PF 1KV CER DISC | 71590 | DD-151 |
| C09 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C10 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C11 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C12 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C13 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C14 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C15 | 80039 | CAPACITR 10 MF 20V SOLID TANT POL 10% | | CS13BE 106K |
| C16 | 79110 | CAPACITR 110 PF 500V SILVER MICA 5% | 14655 | CD15FD111J03 |
| C17 | 70534 | CAPACITR 330 PF 500V SILVER MICA 5% | 14655 | CD15FD331J03 |
| C18 | 79110 | CAPACITR 110 PF 500V SILVER MICA 5% | 14655 | CD15FD111J03 |
| C19 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C20 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C21 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C22 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C23 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C24 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C25 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C26 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C27 | 77960 | CAPACITR 15 PF 500V SILVER MICA 5% | 14655 | CD10CD150J03 |
| C28 | 70613 | CAPACITR 1 MF 200V MET MYLAR CVAL 10% | 84411 | X663F |
| C29 | 70518 | CAPACITR 100 PF 1KV CER DISC | 71590 | DD-101 |
| C30 | 80039 | CAPACITR 10 MF 20V SOLID TANT POL 10% | | CS13BE 106K |
| L01 | 79089 | INDUCTOR 1.62-1.98 UH PC MOUNT | 71279 | 7107-16 |
| L02 | 78716 | INDUCTOR 100 UH SURMIN UNSHLD 10% | 91637 | IR-2 |
| L03 | 78716 | INDUCTOR 100 UH SURMIN UNSHLD 10% | 91637 | IR-2 |
| Q01 | 77147 | TRANSSTR 2N3947 NPN SIL | 04713 | 2N3947 |
| R01 | 71901 | RESISTOR 180 OHM 1/4W 10% COMP | 01121 | RCR07G181KS |
| R02 | 71977 | RESISTOR 2.2K OHM 1/4W 10% COMP | 01121 | RCR07G222KS |
| R03 | 71977 | RESISTOR 2.2K OHM 1/4W 10% COMP | 01121 | RCR07G222KS |
| R04 | 71977 | RESISTOR 2.2K OHM 1/4W 10% COMP | 01121 | RCR07G222KS |
| R05 | 81731 | RESISTOR 5.36K OHM RN60C 1% MTL FLM | | RN60C5361F |
| R06 | 78572 | RESISTOR 3.32K OHM RN60C 1% MTL FLM | | RN60C3321F |
| R07 | 78022 | POT 1 M OHM 3/4W CERMET 20T PC MT | 80294 | 3009-1-105 |
| R08 | 82111 | RESISTOR 2.87K OHM RN60C 1% MTL FLM | | RN60C2871F |
| R09 | 77597 | POT 5K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR5K |
| R10 | 82131 | RESISTOR 14.7K OHM RN60C 1% MTL FLM | | RN60C1472F |
| R11 | 76958 | POT 100K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR100K |
| R12 | 82107 | RESISTOR 2.26K OHM RN60C 1% MTL FLM | | RN60C2261F |
| R13 | 77597 | POT 5K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR5K |
| R14 | 80211 | RESISTOR 14.0K OHM RN60C 1% MTL FLM | | RN60C1402F |
| R15 | 72214 | RESISTOR 4.7 MEG 1/4W 10% COMP | 01121 | RCR07G475KS |
| R16 | 82139 | RESISTOR 27.4K OHM RN60C 1% MTL FLM | | RN60C2742F |
| R17 | 82138 | RESISTOR 24.9K OHM RN60C 1% MTL FLM | | RN60C2492F |
| R18 | 78246 | RESISTOR 10.0K OHM RN60C 1% MTL FLM | | RN60C1002F |
| R19 | 79236 | RESISTOR 909 OHM RN60C 1% MTL FLM | | RN60C9090F |

SCAN CONTROL PWR ASSY

REF DESIG PREFIX A01A05

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| R20 | 78246 | RESISTOR 10.0K OHM RN60C 1% MTL FLM | | RN60C1002F |
| R21 | 78461 | RESISTOR 100 OHM RN60C 1% MTL FLM | | RN60C1000F |
| R22 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R23 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R24 | 71918 | RESISTOR 330 OHM 1/4W 10% COMP | 01121 | RCR07G331KS |
| R25 | 71977 | RESISTOR 2.2K OHM 1/4W 10% COMP | 01121 | RCR07G222KS |
| R26 | 71966 | RESISTOR 1.5K OHM 1/4W 10% COMP | 01121 | RCR07G152KS |
| R27 | 72002 | RESISTOR 4.7K OHM 1/4W 10% COMP | 01121 | RCR07G472KS |
| R28 | 71941 | RESISTOR 820 OHM 1/4W 10% COMP | 01121 | RCR07G821KS |
| R29 | 71977 | RESISTOR 2.2K OHM 1/4W 10% COMP | 01121 | RCR07G222KS |
| R30 | 78243 | RESISTOR 40.2K OHM RN60C 1% MTL FLM | | RN60C4022F |
| R31 | 78246 | RESISTOR 10.0K OHM RN60C 1% MTL FLM | | RN60C1002F |
| R32 | 71977 | RESISTOR 2.2K OHM 1/4W 10% COMP | 01121 | RCR07G222KS |
| R33 | 78571 | RESISTOR 2.21K OHM RN60D 1% MTL FLM | | RN60D2211F |
| R34 | 78246 | RESISTOR 10.0K OHM RN60C 1% MTL FLM | | RN60C1002F |
| R35 | 76958 | POT 100K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR100K |
| R36 | 81340 | RESISTOR 68.1K OHM RN60C 1% MTL FLM | | RN60C6812F |
| R37 | 78137 | POT 2K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR2K |
| R38 | 82127 | RESISTOR 11.0K OHM RN60C 1% MTL FLM | | RN60C1102F |
| R39 | 78137 | POT 2K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR2K |
| R40 | 82117 | RESISTOR 5.62K OHM RN60C 1% MTL FLM | | RN60C5621F |
| R41 | 77394 | POT 500 OHM 3/4W CERMET 15T PC MT | 73138 | 79P500 |
| R42 | 79628 | RESISTOR 1.87K OHM RN60C 1% MTL FLM | | RN60C1871F |
| R43 | 72014 | RESISTOR 6.8K OHM 1/4W 10% COMP | 01121 | RCR07G682KS |
| R44 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R45 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R46 | 71973 | RESISTOR 1.8K OHM 1/4W 10% COMP | 01121 | RCR07G182KS |
| U01 | 84281 | IC TTL HEX INVERTER | 01295 | SN74LS04N |
| U02 | 84960 | IC TTL 4-BIT SYNCHRONOUS COUNTER | | SN74LS161N |
| U03 | 84283 | IC TTL DUAL D-TYPE FLIP-FLOP | 01295 | SN74LS74N |
| U04 | 84958 | IC CMOS QUAD BILATERAL SWITCH | | CD4066AE |
| U05 | 81840 | IC OP AMP 8PIN DIP INT.COMP. DUAL 741C | 04713 | MC1458P1 |
| U06 | 84878 | IC TTL DIVIDE BY 12 COUNTER | | SN74LS92N |
| U07 | 81795 | IC BALANCED MIXER | 01295 | SN76514N |
| U08 | 83784 | IC TTL MONOSTBL MULTIVIBRATOR LOW POWER | 01295 | SN74L121N |
| U09 | 84958 | IC CMOS QUAD BILATERAL SWITCH | | CD4066AE |
| U10 | 78977 | IC OP AMP GEN.PUR.TO-5 INT.COMP+70C 741C | 04713 | MC1741CG |
| Y01 | 84953 | CRYSTAL 6.000 MHZ .001% SERIES MODE | | HC18/U HOLDER |

## METER AND RECORDER INTERFACE PWB ASSY

REF DESIG PREFIX A01A06

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR02 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR03 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR04 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR05 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR06 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR07 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR08 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR09 | 77488 | DIODE 1N4737A SI ZEN 7.5V 5% 1W | 04713 | 1N4737A |
| CR10 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR11 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR12 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR13 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR14 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR15 | 79658 | DIODE 1N938 TC REF 9.0V .001% .5W | 04713 | 1N938 |
| CR16 | 77869 | DIODE 1N751A SI ZEN 5.1V 5% .4W | 04713 | 1N751A |
| C01 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T3628106K025AS |
| C02 | 70590 | CAPACITR .1 MF 100V MYLAR 10% | | |
| C03 | 70613 | CAPACITR 1 MF 200V MET MYLAR OVAL 10% | 84411 | X663F |
| C04 | 70613 | CAPACITR 1 MF 200V MET MYLAR OVAL 10% | 84411 | X663F |
| C05 | 70613 | CAPACITR 1 MF 200V MET MYLAR OVAL 10% | 84411 | X663F |
| C06 | 70590 | CAPACITR .1 MF 100V MYLAR 10% | 14655 | WMF1P1F |
| C07 | 70613 | CAPACITR 1 MF 200V MET MYLAR OVAL 10% | 84411 | X663F |
| C08 | 70590 | CAPACITR .1 MF 100V MYLAR 10% | 14655 | WMF1P1E |
| C09 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T3628106K025AS |
| C10 | 70590 | CAPACITR .1 MF 100V MYLAR 10% | 14655 | WMF1P1F |
| C11 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T3628106K025AS |
| C12 | 70590 | CAPACITR .1 MF 100V MYLAR 10% | 14655 | WMF1P1F |
| C13 | 80039 | CAPACITR 10 MF 20V SOLID TANT POL 10% | | CS13BE 106K |
| C14 | 97100 | CUSTOMER SUPPLIED ITEM | | |
| C15 | 80039 | CAPACITR 10 MF 20V SOLID TANT POL 10% | | CS13BE 106K |
| C16 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C17 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C18 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C19 | 70531 | CAPACITR 270 PF 500V SILVER MICA 5% | 14655 | CD15FD271J03 |
| C20 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| J01 | 79660 | TRANSSTR 2N4093 FET N-CHNL JUNC | 04713 | 2N4093 |
| J02 | 77147 | TRANSSTR 2N3947 NPN SIL | 04713 | 2N3947 |
| Q03 | 77148 | TRANSSTR 2N3251 PNP SIL | 04713 | 2N3251 |
| R01 | 72165 | RESISTOR 470K OHM 1/4W 10% COMP | 01121 | RCR07G474KS |
| R02 | 72165 | RESISTOR 470K OHM 1/4W 10% COMP | 01121 | RCR07G474KS |
| R03 | 72165 | RESISTOR 470K OHM 1/4W 10% COMP | 01121 | RCR07G474KS |
| R04 | 72165 | RESISTOR 470K OHM 1/4W 10% COMP | 01121 | RCR07G474KS |
| R05 | 81341 | RESISTOR 22 MEG 1/4W 10% COMP | 01121 | RCR07G226KS |
| R06 | 79248 | RESISTOR 1.00K OHM RN60C 1% MTL FLM | | RN60C1001F |
| R07 | 81218 | RESISTOR 20.5K OHM RN60C 1% MTL FLM | | RN60C2052F |
| R08 | 79571 | RESISTOR 2.21K OHM RN60D 1% MTL FLM | | RN60D2211F |
| R09 | 78571 | RESISTOR 2.21K OHM RN60D 1% MTL FLM | | RN60D2211F |
| R10 | 72002 | RESISTOR 4.7K OHM 1/4W 10% COMP | 01121 | RCR07G472KS |
| R11 | 82126 | RESISTOR 10.5K OHM RN60C 1% MTL FLM | | RN60C1052F |
| R12 | 81218 | RESISTOR 20.5K OHM RN60C 1% MTL FLM | | RN60C2052F |
| R13 | 82156 | RESISTOR 127K OHM RN60C 1% MTL FLM | | RN60C1273F |
| R14 | 76933 | POT 50K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR50K |
| R15 | 77597 | POT 5K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR5K |
| R16 | 78906 | RESISTOR 4.99K OHM RN60C 1% MTL FLM | | RN60C4991F |
| R17 | 80242 | RESISTOR 90.9K OHM RN60C 1% MTL FLM | | RN60C9092F |
| R18 | 83641 | POT 20K OHM 3/4W CERMET 15T PC MT | 73138 | 79PR20K |
| R19 | 81341 | RESISTOR 22 MEG 1/4W 10% COMP | 01121 | RCR07G226KS |
| R20 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R21 | 78248 | RESISTOR 1.00K OHM RN60C 1% MTL FLM | | RN60C1001F |
| R22 | 78235 | RESISTOR 1.82K OHM RN60D 1% MTL FLM | | RN60D1821F |
| R23 | 80913 | POT 100 OHM 3/4W CERMET PC MT | 80294 | 3009P-1-101 |
| R24 | 78859 | RESISTOR 150 OHM RN60C 1% MTL FLM | | RN60C1500F |
| R25 | 72034 | RESISTOR 12K OHM 1/4W 10% COMP | 01121 | RCR07G123KS |
| R26 | 72123 | RESISTOR 150K OHM 1/4W 10% COMP | 01121 | RCR07G154KS |
| R27 | 82111 | RESISTOR 2.87K OHM RN60C 1% MTL FLM | | RN60C2871F |
| R28 | 78246 | RESISTOR 10.0K OHM RN60C 1% MTL FLM | | RN60C1002F |

METER AND RECORDER INTERFACE PWB ASSY

REF DESIG PREFIX A01A06

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| R29 | 72014 | RESISTOR 6.8K OHM 1/4W 10% COMP | 01121 | RCR07G682KS |
| R30 | 82191 | RESISTOR 49.9 OHM RN60C 1% MTL FLM | | RN60C49R9F |
| R31 | 71313 | RESISTOR 270 OHM 1/4W 10% COMP | 01121 | RCR07G271KS |
| R32 | 80913 | POT 100 OHM 3/4% CERMET PC MT | 80294 | 3009P-1-101 |
| R33 | 71897 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R34 | 83885 | RESISTOR 1.10K OHM RN55C 1% MTL FLM | | RN55C1101F |
| R35 | 80382 | RESISTOR 11.0K OHM RN55C 1% MTL FLM | | RN55C1102F |
| R36 | 83098 | RESISTOR 649 OHM RN55C 1% MTL FLM | | RN55C6490F |
| R37 | 78933 | RESISTOR 10.0K OHM RN55C 1% MTL FLM | | RN55C1002F |
| R38 | 79931 | RESISTOR 820K OHM 1/3W 5% COMP | 01121 | RCR05G824JS |
| R39 | 83915 | RESISTOR 9.53K OHM RN55C 1% MTL FLM | | RN55C9531F |
| R40 | 76598 | POT 2K OHM 1W 4W 20T PC MT | 80294 | 3005P-1-202 |
| R41 | 71973 | RESISTOR 1.8K OHM 1/4W 10% COMP | 01121 | RCR07G182KS |
| R42 | 71938 | RESISTOR 680 OHM 1/4W 10% COMP | 01121 | RCR07G621KS |
| R43 | 71913 | RESISTOR 270 OHM 1/4W 10% COMP | 01121 | RCR07G271KS |
| U01 | 83017 | IC CMOS QUAD 2-IN NOR GATE | 04713 | MC14001CP |
| U02 | 84958 | IC CMOS QUAD BILATERAL SWITCH | | CD4066AE |
| U03 | 81840 | IC OP AMP 8PIN DIP INT.COMP. DUAL 741C | 04713 | MC1458P1 |
| U04 | 81840 | IC OP AMP 8PIN DIP INT.COMP. DUAL 741C | 04713 | MC1458P1 |
| U05 | 81840 | IC OP AMP 8PIN DIP INT.COMP. DUAL 741C | 04713 | MC1458P1 |
| U06 | 81840 | IC OP AMP 8PIN DIP INT.COMP. DUAL 741C | 04713 | MC1458P1 |

POWER SUPPLY PWR ASSY

REF DESIG PREFIX A01A09

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 80895 | RECTIFIER ASSY 100V 6A SOLDER LUGS | 83003 | VH148 |
| CR02 | 80895 | RECTIFIER ASSY 100V 6A SOLDER LUGS | 83003 | VH148 |
| CR03 | 78274 | DIODE IN4002 SIL 100V 1A | 04713 | 1N4002 |
| C01 | 77245 | CAPACITR 3000 MF 30V | 80183 | 39D308G030JS4 |
| C02 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C03 | 77901 | CAPACITR .0015 MF 500V SILVER MICA 5% | 14655 | CD19FD152J03 |
| C04 | 77901 | CAPACITR .0015 MF 500V SILVER MICA 5% | 14655 | CD19FD152J03 |
| C05 | 77245 | CAPACITR 3000 MF 30V | 80183 | 39D308G030JS4 |
| C06 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C07 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C08 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C09 | 84077 | CAPACITR 3200 MF 25V | | 39D328G025JP4 |
| C10 | 81101 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C11 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C12 | 81995 | CAPACITR .001 MF 100V CER MONO X7R 10% | 72982 | 8121-100-X7R-102K |
| C13 | 81995 | CAPACITR .001 MF 100V CER MONO X7R 10% | 72982 | 8121-100-X7R-102K |
| F01 | 71221 | FUSE 1 1/2 AMP | 75915 | 3AG |
| F02 | 71219 | FUSE 1 AMP | 75915 | 3AG |
| HY01 | 85091 | CROWBAR 17 VDC 5% 3A | | LVC-1212 |
| HY02 | 85091 | CROWBAR 17 VDC 5% 3A | | LVC-1212 |
| HY03 | 85139 | CROWBAR 5.6 VDC 5% 3A | | LVC-1218 |
| Q01 | 77148 | TRANSSTR 2N3251 PNP SIL | 04713 | 2N3251 |
| Q02 | 77147 | TRANSSTR 2N3947 NPN SIL | 04713 | 2N3947 |
| R01 | 81893 | RESISTOR .5 OHM 5W | 24681 | FRL5 |
| R02 | 71862 | RESISTOR 47 OHM 1/4W 10% COMP | 01121 | RCR07G470KS |
| R03 | 71813 | RESISTOR .5 OHM 3W | 24681 | VAL3 |
| R04 | 71822 | RESISTOR 3 OHM 3W | 24681 | VAL3 |
| R05 | 77298 | RESISTOR 1 OHM 3W | 24681 | VAL-3 |
| R06 | 83570 | RESISTOR 1.5 OHM 3W | 24681 | VAL-3 |
| R07 | 71862 | RESISTOR 47 OHM 1/4W 10% COMP | 01121 | RCR07G470KS |
| R08 | 81893 | RESISTOR .5 OHM 5W | 24681 | FRL5 |
| R09 | 81893 | RESISTOR .5 OHM 5W | 24681 | FRL5 |
| R10 | 79714 | RESISTOR 27.4K OHM RN55C 1% MTL FLM | | RN55C2742F |
| R11 | 76979 | POT 20K OHM 1W WW 20T PC MT | 80294 | 3005P-1-203 |
| R12 | 83935 | RESISTOR 46.4K OHM RN55C 1% MTL FLM | | RN55C4642F |
| R13 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R14 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R15 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R16 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R17 | 72039 | RESISTOR 15K OHM 1/4W 10% COMP | 01121 | RCR07G153KS |
| R18 | 72039 | RESISTOR 15K OHM 1/4W 10% COMP | 01121 | RCR07G153KS |
| U01 | 85164 | IC VOLTAGE RGLTR +-15V | | MC1468L |
| U02 | 83235 | IC VOLTAGE RGLTR 5V PLASTIC PKG | 04713 | MC7805CP |

MOTHER BOARD, CARD CAGE ASSY

REF DESIG PREFIX A01A10

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 78274 | DIODE 1N4002 SIL 100V 1A | 04713 | 1N4002 |
| J01 | 78279 | CONNECTR 22 PIN DOUBLE READOUT | 71785 | 252-22-30-160 |
| J02 | 78279 | CONNECTR 22 PIN DOUBLE READOUT | 71785 | 252-22-30-160 |
| J03 | 78279 | CONNECTR 22 PIN DOUBLE READOUT | 71785 | 252-22-30-160 |
| J04 | 78279 | CONNECTR 22 PIN DOUBLE READOUT | 71785 | 252-22-30-160 |
| J05 | 78279 | CONNECTR 22 PIN DOUBLE READOUT | 71785 | 252-22-30-160 |
| J06 | 78279 | CONNECTR 22 PIN DOUBLE READOUT | 71785 | 252-22-30-160 |
| J07 | 78279 | CONNECTR 22 PIN DOUBLE READOUT | 71785 | 252-22-30-160 |
| J08 | 78279 | CONNECTR 22 PIN DOUBLE READOUT | 71785 | 252-22-30-160 |
| J09 | 94930 | CONN HEADER DBL ROW STRAIGHT 20-PIN PC | | 1-87227-0 |
| J10 | 85126 | CONN HEADER DBL ROW STRAIGHT 10-PIN PC | | 87227-5 |
| J11 | 85126 | CONN HEADER DBL ROW STRAIGHT 10-PIN PC | | 87227-5 |
| J12 | 84930 | CONN HEADER DBL ROW STRAIGHT 20-PIN PC | | 1-87227-0 |
| J13 | 84930 | CONN HEADER DBL ROW STRAIGHT 20-PIN PC | | 1-87227-0 |
| J14 | 85126 | CONN HEADER DBL ROW STRAIGHT 10-PIN PC | | 87227-5 |
| J15 | 85126 | CONN HEADER DBL ROW STRAIGHT 10-PIN PC | | 87227-5 |
| J16 | 85127 | CONN HEADER DBL ROW STRAIGHT 26-PIN PC | | 1-87227-3 |
| J17 | | NOT ASSIGNED | | |
| J18 | | NOT ASSIGNED | | |
| J19 | 85126 | CONN HEADER DBL ROW STRAIGHT 10-PIN PC | | 87227-5 |

30KHZ IF MODULE ASSY

REF DESIG PREFIX A02

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 71122 | DIODE 1N914 SIL 75V 75MA | 80368 | 1N914 |
| CR02 | 71122 | DIODE 1N914 SIL 75V 75MA | 80368 | 1N914 |
| C01 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C02 | 70470 | CAPACITR 10 PF 500V SILVER MICA 5% | 14655 | CD15CD100J03 |
| C03 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C04 | 70470 | CAPACITR 10 PF 500V SILVER MICA 5% | 14655 | CD15CD100J03 |
| C05 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C06 | 70470 | CAPACITR 10 PF 500V SILVER MICA 5% | 14655 | CD15CD100J03 |
| C07 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C08 | 70470 | CAPACITR 10 PF 500V SILVER MICA 5% | 14655 | CD15CD100J03 |
| C09 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C10 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C11 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C12 | 82970 | CAPACITR .0024 MF 500V SILVER MICA 1% | 53021 | D205F242F0 |
| C13 | 82974 | CAPACITR .01 MF 500V SILVER MICA 1% | 53021 | D305F103F0 |
| C14 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C15 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C16 | 75196 | CAPACITR .0018 MF 500V SILVER MICA 5% | 14655 | CD19FD182J03 |
| C17 | 82974 | CAPACITR .01 MF 500V SILVER MICA 1% | 53021 | D305F103F0 |
| C18 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C19 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C20 | 78806 | CAPACITR 200 PF 500V SILVER MICA 1% | 84171 | DM-15-201F |
| C21 | 70487 | CAPACITR 27 PF 500V SILVER MICA 5% | 14655 | CD15ED270J03 |
| C22 | 78818 | CAPACITR 390 PF 500V SILVER MICA 1% | 84171 | DM-15-391F |
| C23 | 70487 | CAPACITR 27 PF 500V SILVER MICA 5% | 14655 | CD15ED270J03 |
| C24 | 78806 | CAPACITR 200 PF 500V SILVER MICA 1% | 84171 | DM-15-201F |
| C25 | 70470 | CAPACITR 10 PF 500V SILVER MICA 5% | 14655 | CD15CD100J03 |
| C26 | 70544 | CAPACITR .001 MF 1KV CER DISC | 71590 | DD102 |
| C27 | 70544 | CAPACITR .001 MF 1KV CER DISC | 71590 | DD102 |
| C28 | 70544 | CAPACITR .001 MF 1KV CER DISC | 71590 | DD102 |
| C29 | 70544 | CAPACITR .001 MF 1KV CER DISC | 71590 | DD102 |
| C30 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C31 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C32 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C33 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C34 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C35 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C36 | 70544 | CAPACITR .001 MF 1KV CER DISC | 71590 | DD102 |
| C37 | 70544 | CAPACITR .001 MF 1KV CER DISC | 71590 | DD102 |
| C38 | 70544 | CAPACITR .001 MF 1KV CER DISC | 71590 | DD102 |
| C39 | 70544 | CAPACITR .001 MF 1KV CER DISC | 71590 | DD102 |
| C40 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C41 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| J01 | 85152 | CONN COAX CONHX SNAP-ON MALE TO SLDR CUP | | 51-143-0000 |
| J01 | | NOT ASSIGNED | | |
| J02 | | NOT ASSIGNED | | |
| J02 | 85152 | CONN COAX CONHX SNAP-ON MALE TO SLDR CUP | | 51-143-0000 |
| J03 | 85138 | CONN HEADER DBL ROW RT ANGLE 26-PIN PC | | 1-87230-3 |
| L01 | 147522 | COIL ASSY 1.74-KHZ BANDPASS FILTER | | |
| L02 | 147522 | COIL ASSY 1.74-KHZ BANDPASS FILTER | | |
| L03 | 84995 | INDUCTOR 27 MH MIN SHLD ENCAP 10% | | SWD-27000 |
| L04 | 84995 | INDUCTOR 27 MH MIN SHLD ENCAP 10% | | SWD-27000 |
| L05 | 78716 | INDUCTOR 100 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L06 | 78716 | INDUCTOR 100 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L07 | 85053 | INDUCTOR 22 MH MIN SHLD ENCAP 10% | | SWD22000 |
| R01 | 78924 | RESISTOR 20.0K OHM RN55C 1% MTL FLM | | RN55C2002F |
| R02 | 78924 | RESISTOR 20.0K OHM RN55C 1% MTL FLM | | RN55C2002F |
| R03 | 83918 | RESISTOR 12.7K OHM RN55C 1% MTL FLM | | RN55C1272F |
| R04 | 84883 | POT 1K OHM 1/2W CERMET 20T PC MT 3/8 SQ | | 66WR1K |
| R05 | 78924 | RESISTOR 20.0K OHM RN55C 1% MTL FLM | | RN55C2002F |
| R06 | 83913 | RESISTOR 7.87K OHM RN55C 1% MTL FLM | | RN55C7871F |
| R07 | 84883 | POT 1K OHM 1/2W CERMET 20T PC MT 3/8 SQ | | 66WR1K |
| R08 | 83923 | RESISTOR 20.5K OHM RN55C 1% MTL FLM | | RN55C2052F |

30KHZ IF MODULE ASSY

REF DESIG PREFIX A02

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| R09 | 78924 | RESISTOR 20.0K OHM RN55C 1% MTL FLM | | RN55C2002F |
| R10 | 78924 | RESISTOR 20.0K OHM RN55C 1% MTL FLM | | RN55C2002F |
| R11 | 83921 | RESISTOR 17.8K OHM RN55C 1% MTL FLM | | RN55C1782F |
| R12 | 78924 | RESISTOR 20.0K OHM RN55C 1% MTL FLM | | RN55C2002F |
| R13 | 80198 | RESISTOR 16.2K OHM RN55C 1% MTL FLM | | RN55C1622F |
| R14 | 83923 | RESISTOR 20.5K OHM RN55C 1% MTL FLM | | RN55C2052F |
| R15 | 78934 | RESISTOR 15.0K OHM RN55C 1% MTL FLM | | RN55C1502F |
| R16 | 80202 | RESISTOR 21.0K OHM RN55D 1% MTL FLM | | RN55D2102F |
| R17 | 78924 | RESISTOR 20.0K OHM RN55C 1% MTL FLM | | RN55C2002F |
| R18 | 78924 | RESISTOR 20.0K OHM RN55C 1% MTL FLM | | RN55C2002F |
| R19 | 83911 | RESISTOR 5.62K OHM RN55C 1% MTL FLM | | RN55C5621F |
| R20 | 84883 | POT 1K OHM 1/2W CERMET 20T PC MT 3/8 SQ | | 66WR1K |
| R21 | 78924 | RESISTOR 20.0K OHM RN55C 1% MTL FLM | | RN55C2002F |
| R22 | 83909 | RESISTOR 4.87K OHM RN55C 1% MTL FLM | | RN55C4871F |
| R23 | 84883 | POT 1K OHM 1/2W CERMET 20T PC MT 3/8 SQ | | 66WR1K |
| R24 | 78926 | RESISTOR 49.9K OHM RN55C 1% MTL FLM | | RN55C4992F |
| R25 | 78924 | RESISTOR 20.0K OHM RN55C 1% MTL FLM | | RN55C2002F |
| R26 | 78924 | RESISTOR 20.0K OHM RN55C 1% MTL FLM | | RN55C2002F |
| R27 | 83909 | RESISTOR 4.87K OHM RN55C 1% MTL FLM | | RN55C4871F |
| R28 | 84883 | POT 1K OHM 1/2W CERMET 20T PC MT 3/8 SQ | | 66WR1K |
| R29 | 78926 | RESISTOR 49.9K OHM RN55C 1% MTL FLM | | RN55C4992F |
| R30 | 83903 | RESISTOR 3.32K OHM RN55C 1% MTL FLM | | RN55C3321F |
| R31 | 78931 | RESISTOR 4.99K OHM RN55C 1% MTL FLM | | RN55C4991F |
| R32 | 79717 | RESISTOR 6.49K OHM RN55C 1% MTL FLM | | RN55C6491F |
| R33 | 84884 | POT 5K OHM 1/2W CERMET 20T PC MT 3/8 SQ | | 66WR5K |
| R34 | 78932 | RESISTOR 10.0K OHM RN55C 1% MTL FLM | | RN55C1002F |
| R35 | 78933 | RESISTOR 10.0K OHM RN55C 1% MTL FLM | | RN55C1002F |
| R36 | 83921 | RESISTOR 17.8K OHM RN55C 1% MTL FLM | | RN55C1782F |
| R37 | 84884 | POT 5K OHM 1/2W CERMET 20T PC MT 3/8 SQ | | 66WR5K |
| R38 | 83089 | RESISTOR 75.0 OHM RN55C 1% MTL FLM | | RN55C75R0F |
| R39 | 72064 | RESISTOR 33K OHM 1/4W 10% COMP | 01121 | RCR07G333KS |
| R40 | 72139 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R41 | 72064 | RESISTOR 33K OHM 1/4W 10% COMP | 01121 | RCR07G333KS |
| R42 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R43 | 72064 | RESISTOR 33K OHM 1/4W 10% COMP | 01121 | RCR07G333KS |
| R44 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R45 | 72064 | RESISTOR 33K OHM 1/4W 10% COMP | 01121 | RCR07G333KS |
| R46 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R47 | 71849 | RESISTOR 100 OHM 1/2W 10% COMP | 01121 | RCR20G101KS |
| R48 | 72064 | RESISTOR 33K OHM 1/4W 10% COMP | 01121 | RCR07G333KS |
| R49 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R50 | 72064 | RESISTOR 33K OHM 1/4W 10% COMP | 01121 | RCR07G333KS |
| R51 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R52 | 72064 | RESISTOR 33K OHM 1/4W 10% COMP | 01121 | RCR07G333KS |
| R53 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R54 | 72064 | RESISTOR 33K OHM 1/4W 10% COMP | 01121 | RCR07G333KS |
| R55 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R56 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| U01 | 84291 | IC CMOS TRIPLE 2-IN ANALOG MUX/DEMUX | 79089 | CD4053AE |
| U02 | 84886 | IC OP AMP WIDEBAND 8-PIN DIP | | LM318N |
| U03 | 84291 | IC CMOS TRIPLE 2-IN ANALOG MUX/DEMUX | 79089 | CD4053AE |
| U04 | 84291 | IC CMOS TRIPLE 2-IN ANALOG MUX/DEMUX | 79089 | CD4053AE |
| U05 | 84886 | IC OP AMP WIDEBAND 8-PIN DIP | | LM318N |
| U06 | 84291 | IC CMOS TRIPLE 2-IN ANALOG MUX/DEMUX | 79089 | CD4053AE |
| U07 | 84886 | IC OP AMP WIDEBAND 8-PIN DIP | | LM318N |
| U08 | 84683 | IC CMOS QUAD ANALOG SWITCH | | MC14066CP |
| U09 | 84886 | IC OP AMP WIDEBAND 8-PIN DIP | | LM318N |
| U10 | 83017 | IC CMOS QUAD 2-IN NOR GATE | 04713 | MC14001CP |
| U11 | 83016 | IC CMOS QUAD 2-IN NAND GATE | 04713 | MC14011CP |
| U12 | 84291 | IC CMOS TRIPLE 2-IN ANALOG MUX/DEMUX | 79089 | CD4053AE |
| U13 | 84886 | IC OP AMP WIDEBAND 8-PIN DIP | | LM318N |
| U14 | 84111 | IC CMOS QUAD 2-IN AND GATE | | |
| U15 | 83014 | IC CMOS HEX INVERTER/BUFFER | 04713 | MC14049CP |
| U16 | 84145 | IC CMOS QUAD 2-IN OR GATE +85C | 04713 | MC14071CP |

BASEBAND CONVERTER MODULE ASSY.

REF DESIG PREFIX A05

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR02 | 83981 | DIODE 1N5223B SI ZEN 2.7V 5% .5W | 13715 | 1N5223B |
| CR03 | 84951 | MIXER DOUBLE BALANCED 5-500 MHZ PC MT | | PAY-1 |
| CR04 | 84170 | MIXER DOUBLE BALANCED .5-500MHZ PC MT | | SRA-1 |
| CR05 | 71143 | DIODE 1N4735A SI ZEN 6.2V 5% 1W | 04713 | 1N4735A |
| CR06 | 74186 | DIODE 1N935A TC REF 9.0V .01% .5W | 04713 | 1N935A |
| CR07 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| C01 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| C02 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C03 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C04 | 81971 | CAPACITR 2.2 PF 100V CER DISC | 72982 | 835-024-C0G0229B |
| C05 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C06 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C07 | 81746 | CAPACITR 1 PF 500V CER DISC | 72982 | 831-C0K0-109C |
| C08 | 79143 | CAPACITR 2-8 PF MIN CER DISC PC MT | 72982 | 538-011 A 2-8 |
| C09 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C10 | 81971 | CAPACITR 2.2 PF 100V CER DISC | 72982 | 835-024-C0G0229B |
| C11 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C12 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C13 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C14 | 79171 | CAPACITR 9-35 PF MIN CER DISC PC MT | 72982 | 538-011 D 9-35 |
| C15 | 70509 | CAPACITR 68 PF 500V SILVER MICA 5% | 14655 | CD15ED680J03 |
| C16 | 79335 | CAPACITR 430 PF 500V SILVER MICA 5% | 14655 | CD15FD431J03 |
| C17 | 79097 | CAPACITR 3-15 PF MIN CER DISC PC MT | 72982 | 538-011 D 3-15 |
| C18 | 81995 | CAPACITR .001 MF 100V CER MONO X7R 10% | 72982 | 8121-100-X7R-102K |
| C19 | 82400 | CAPACITR 82 PF 500V SILVER MICA 1% | 84171 | DM-15-820F |
| C20 | 35760 | CAPACITR 4 PF 500V CER DISC | 72982 | 831-C0H0-409C |
| C21 | 78808 | CAPACITR 220 PF 500V SILVER MICA 1% | 84171 | DM-15-221F |
| C22 | 81934 | CAPACITR 18 PF 500V CER DISC | 72982 | 831-C0G0-180J |
| C23 | 78807 | CAPACITR 210 PF 500V SILVER MICA 1% | 84171 | DM-15-211F |
| C24 | 81931 | CAPACITR 15 PF 500V CER DISC | 72982 | 831-C0G0-150J |
| C25 | 81824 | CAPACITR 79 PF 100V SILVER MICA 2% | 53021 | D151C790G03 |
| C26 | 84561 | CAPACITR .0027 MF 500V SILVER MICA 5% | 14655 | CD19FD272J03 |
| C27 | 70599 | CAPACITR .200 MF 100V DIPPED MYLAR 5% | 72136 | MDE204JB2A |
| C28 | 81808 | CAPACITR 2.2 MF 50V CER MONO 20% | 00656 | 8141-M050-225M |
| C29 | 79097 | CAPACITR 3-15 PF MIN CER DISC PC MT | 72982 | 538-011 D 3-15 |
| C30 | 79143 | CAPACITR 2-8 PF MIN CER DISC PC MT | 72982 | 538-011 A 2-8 |
| C31 | 79143 | CAPACITR 2-8 PF MIN CER DISC PC MT | 72982 | 538-011 A 2-8 |
| C32 | 79143 | CAPACITR 2-8 PF MIN CER DISC PC MT | 72982 | 538-011 A 2-8 |
| C33 | 79097 | CAPACITR 3-15 PF MIN CER DISC PC MT | 72982 | 538-011 D 3-15 |
| C34 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C35 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C36 | 70496 | CAPACITR 43 PF 500V SILVER MICA 5% | 14655 | CD15ED430J03 |
| C37 | 79171 | CAPACITR 9-35 PF MIN CER DISC PC MT | 72982 | 538-011 D 9-35 |
| C38 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| C39 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| C40 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| C41 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C42 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C43 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C44 | 81995 | CAPACITR .001 MF 100V CER MONO X7R 10% | 72982 | 8121-100-X7R-102K |
| C45 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C46 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C47 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C48 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C49 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C50 | 75200 | CAPACITR .0024 MF 500V SILVER MICA 5% | 84171 | DM19 242J |
| C51 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C52 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C53 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C54 | 70525 | CAPACITR 150 PF 1KV CER DISC | 71590 | DD-151 |
| C55 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C56 | 70487 | CAPACITR 27 PF 500V SILVER MICA 5% | 14655 | CD15ED270J03 |
| C57 | 81995 | CAPACITR .001 MF 100V CER MONO X7R 10% | 72982 | 8121-100-X7R-102K |
| C58 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C59 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C60 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C61 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C62 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T3628106K025AS |
| C63 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T3628106K025AS |
| C64 | 70519 | CAPACITR 120 PF 500V SILVER MICA 5% | 14655 | CD15FD121J03 |

BASEBAND CONVERTER MODULE ASSY.

REF DESIG PREFIX A05

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| C65 | 97100 | CUSTOMER SUPPLIED ITEM | | |
| E05 | 81718 | CORE BEAD FERRITE 7D .138X.037X.150L | 78488 | 57-1413 |
| E06 | 81718 | CORE BEAD FERRITE 7D .138X.037X.150L | 78488 | 57-1413 |
| E07 | | | | |
| E08 | | | | |
| J01 | 84937 | CONN COAX CONHX SNAP-ON MALE TC SLDR CUP | | 51-145-0000 |
| J02 | 84937 | CONN COAX CONHX SNAP-ON MALE TC SLDR CUP | | 51-145-0000 |
| J03 | 84937 | CONN COAX CONHX SNAP-ON MALE TC SLDR CUP | | 51-145-0000 |
| J04 | 84937 | CONN COAX CONHX SNAP-ON MALE TC SLDR CUP | | 51-145-0000 |
| J05 | 84937 | CONN COAX CONHX SNAP-ON MALE TC SLDR CUP | | 51-145-0000 |
| J06 | 81632 | JACK CONNECTOR .040 DIA | 71279 | 450-3704-01-01-01 |
| J07 | 81632 | JACK CONNECTOR .040 DIA | 71279 | 450-3704-01-01-01 |
| J08 | 81632 | JACK CONNECTOR .040 DIA | 71279 | 450-3704-01-01-01 |
| J09 | 81632 | JACK CONNECTOR .040 DIA | 71279 | 450-3704-01-01-01 |
| J10 | 81632 | JACK CONNECTOR .040 DIA | 71279 | 450-3704-01-01-01 |
| J11 | 81632 | JACK CONNECTOR .040 DIA | 71279 | 450-3704-01-01-01 |
| J12 | 81632 | JACK CONNECTOR .040 DIA | 71279 | 450-3704-01-01-01 |
| J13 | 81632 | JACK CONNECTOR .040 DIA | 71279 | 450-3704-01-01-01 |
| J14 | 84940 | CONN COAX CONHX SNAP-ON MALE PC MT | | 51-151-0000 |
| L01 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L02 | 78926 | INDUCTOR 10 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L03 | 78046 | INDUCTOR 3.3 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L04 | 78046 | INDUCTOR 3.3 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L05 | 78926 | INDUCTOR 10 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L06 | 82572 | INDUCTOR .56 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L07 | 78038 | INDUCTOR 2.2 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L08 | 147524 | COIL ASSEMBLY | | |
| L09 | 147525 | COIL ASSEMBLY | | |
| L10 | 147526 | COIL ASSEMBLY | | |
| L11 | 80117 | INDUCTOR 15 UH SUBMIN UNSHLD 10 | 09021 | 8673-3 |
| L12 | 78930 | INDUCTOR 1.2 MH MIN SHLD ENCAP 10% | 72259 | WEE-1200 |
| L13 | 79348 | INDUCTOR 1.8 UH SUBMIN SHLD ENCAP 10% | 72259 | WEE-WEE-1.8 |
| L14 | 79348 | INDUCTOR 1.8 UH SUBMIN SHLD ENCAP 10% | 72259 | WEE-WEE-1.8 |
| L15 | 79558 | INDUCTOR .33 UH SUBMIN SHLD ENCAP 10% | 72259 | WEE-WEE-.33 |
| L16 | 78716 | INDUCTOR 100 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L17 | 78046 | INDUCTOR 3.3 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L18 | 79926 | INDUCTOR 10 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L19 | 97100 | CUSTOMER SUPPLIED ITEM | | |
| L20 | 97100 | CUSTOMER SUPPLIED ITEM | | |
| L21 | 80909 | INDUCTOR 4.7 UH MIN SHLD MOLDED 10% | 09021 | 15S-4R7K |
| L22 | 79926 | INDUCTOR 10 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| P01 | 82455 | PLUG INSULATED JUMPER .20 SPACING | 71279 | 461-2871-01-00-10 |
| P02 | 82455 | PLUG INSULATED JUMPER .20 SPACING | 71279 | 461-2871-01-00-10 |
| P03 | 82455 | PLUG INSULATED JUMPER .20 SPACING | 71279 | 461-2871-01-00-10 |
| Q01 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q02 | 85042 | TRANSSTR MRF 517 NPN SIL | | MRF 517 |
| Q03 | 85042 | TRANSSTR MRF 517 NPN SIL | | MRF 517 |
| Q04 | 77147 | TRANSSTR 2N3947 NPN SIL | 04713 | 2N3947 |
| Q05 | 77147 | TRANSSTR 2N3947 NPN SIL | 04713 | 2N3947 |
| Q06 | 79329 | TRANSSTR 2N5109 NPN SIL | 79089 | 2N5109 |
| Q07 | 79329 | TRANSSTR 2N5109 NPN SIL | 79089 | 2N5109 |
| Q08 | 77412 | TRANSSTR 2N4416 FET N-CHNL JUNC | 61637 | 2N4416 |
| Q09 | 83100 | TRANSSTR TIS 128 PNP SIL | 01295 | TIS 128 |
| Q10 | 78215 | TRANSSTR 2N5089 NPN SIL | 04713 | 2N5089 |
| R01 | 72093 | RESISTOR 68K OHM 1/4W 10% COMP | 01121 | RCR07G683KS |
| R02 | 71907 | RESISTOR 220 OHM 1/4W 10% COMP | 01121 | RCR07G221KS |
| R03 | 71920 | RESISTOR 390 OHM 1/4W 10% COMP | 01121 | RCR07G391KS |
| R04 | 78920 | RESISTOR 1.00K OHM RN55C 1% MTL FLM | | RN55C1001F |
| R05 | 83089 | RESISTOR 75.0 OHM RN55C 1% MTL FLM | | RN55C75R0F |
| R06 | 83873 | RESISTOR 422 OHM RN55C 1% MTL FLM | | RN55C4220F |

BASEBAND CONVERTER MODULE ASSY.

REF DESIG PREFIX A05

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| R07 | 71862 | RESISTOR 47 OHM 1/4W 10% COMP | 01121 | RCR07G470KS |
| R08 | 71914 | RESISTOR 270 OHM 1/2W 10% COMP | 01121 | RCR20G271KS |
| R09 | 83089 | RESISTOR 75.0 OHM RN55C 1% MTL FLM | | RN55C75R0F |
| R10 | 74722 | RESISTOR 4.7K OHM 1/4W 5% COMP | 01121 | RCR07G472JS |
| R11 | 74711 | RESISTOR 2.7K OHM 1/4W 5% COMP | 01121 | RCR07G272JS |
| R12 | 71913 | RESISTOR 270 OHM 1/4W 10% COMP | 01121 | RCR07G271KS |
| R13 | 74693 | RESISTOR 390 OHM 1/4W 5% COMP | 01121 | RCR07G391JS |
| R14 | 83906 | RESISTOR 3.83K OHM RN55C 1% MTL FLM | | RN55C3831F |
| R15 | 79723 | RESISTOR 51.1 OHM RN55C 1% MTL FLM | | RN55C51R1F |
| R16 | 76707 | RESISTOR 2.7 OHM 1/4W 10% COMP | 01121 | RCR07G2R7KS |
| R17 | 76707 | RESISTOR 2.7 OHM 1/4W 10% COMP | 01121 | RCR07G2R7KS |
| R18 | 78887 | RESISTOR 1.05K OHM RN60C 1% MTL FLM | | RN60C1051F |
| R19 | 76707 | RESISTOR 2.7 OHM 1/4W 10% COMP | 01121 | RCR07G2R7KS |
| R20 | 76896 | RESISTOR 1.0 OHM 1/2W 10% COMP | 01121 | RCR20G1R0KS |
| R21 | 74706 | RESISTOR 1.5K OHM 1/4W 5% COMP | 01121 | RCR07G152JS |
| R22 | 76284 | RESISTOR 3.3 OHM 1/4W 10% COMP | 01121 | RCR07G3R3KS |
| R23 | 74706 | RESISTOR 1.5K OHM 1/4W 5% COMP | 01121 | RCR07G152JS |
| R24 | 83089 | RESISTOR 75.0 OHM RN55C 1% MTL FLM | | RN55C75R0F |
| R25 | 83892 | RESISTOR 909 OHM RN55C 1% MTL FLM | | RN55C9090F |
| R26 | 71862 | RESISTOR 47 OHM 1/4W 10% COMP | 01121 | RCR07G470KS |
| R27 | 80380 | RESISTOR 2.74K OHM RN55C 1% MTL FLM | | RN55C2741F |
| R28 | 83221 | RESISTOR 4.42K OHM RN55C 1% MTL FLM | | RN55C4421F |
| R29 | 78929 | RESISTOR 1.00K OHM RN55C 1% MTL FLM | | RN55C1001F |
| R30 | 76907 | RESISTOR 825 OHM RN55C 1% MTL FLM | | RN55C8250F |
| R31 | 71896 | RESISTOR 120 OHM 1W 10% COMP | 01121 | RCR32G121KS |
| R32 | 71836 | RESISTOR 10 OHM 1/4W 10% COMP | 01121 | RCR07G100KS |
| R33 | 71896 | RESISTOR 120 OHM 1W 10% COMP | 01121 | RCR32G121KS |
| R34 | 76907 | RESISTOR 825 OHM RN55C 1% MTL FLM | | RN55C8250F |
| R35 | 78929 | RESISTOR 1.00K OHM RN55C 1% MTL FLM | | RN55C1001F |
| R36 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R37 | 71951 | RESISTOR 1.0K OHM 1/4W 10% COMP | 01121 | RCR07G102KS |
| R38 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R39 | 71926 | RESISTOR 470 OHM 1/4W 10% COMP | 01121 | RCR07G471KS |
| R40 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R41 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R42 | 83856 | RESISTOR 110 OHM RN55C 1% MTL FLM | | RN55C1100F |
| R43 | 83876 | RESISTOR 499 OHM RN55C 1% MTL FLM | | RN55C4990F |
| R44 | 71977 | RESISTOR 2.2K OHM 1/4W 10% COMP | 01121 | RCR07G222KS |
| R45 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R46 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R47 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R48 | 78918 | RESISTOR 806 OHM RN55C 1% MTL FLM | | RN55C8060F |
| R49 | 84885 | POT 10K OHM 1/2W CERMET 20T PC MT 3/8 SQ | | 6WR10K |
| R50 | 78928 | RESISTOR 100K OHM RN55C 1% MTL FLM | | RN55C1003F |
| R51 | 78928 | RESISTOR 100K OHM RN55C 1% MTL FLM | | RN55C1003F |
| R52 | | NOT ASSIGNED | | |
| R53 | | NOT ASSIGNED | | |
| R54 | 83942 | RESISTOR 75.0K OHM RN55C 1% MTL FLM | | RN55C7502F |
| R55 | 71926 | RESISTOR 470 OHM 1/4W 10% COMP | 01121 | RCR07G471KS |
| R56 | 72054 | RESISTOR 22K OHM 1/4W 10% COMP | 01121 | RCR07G223KS |
| R57 | 79120 | RESISTOR 200 OHM RN55C 1% MTL FLM | | RN55C2000F |
| R58 | 97100 | CUSTOMER SUPPLIED ITEM | | |
| R59 | 84883 | POT 1K OHM 1/2W CERMET 20T PC MT 3/8 SQ | | 66WR1K |
| R60 | 83910 | RESISTOR 5.11K OHM RN55C 1% MTL FLM | | RN55C5111F |
| R61 | 71926 | RESISTOR 470 OHM 1/4W 10% COMP | 01121 | RCR07G471KS |
| R62 | 71977 | RESISTOR 2.2K OHM 1/4W 10% COMP | 01121 | RCR07G222KS |
| R63 | 71857 | RESISTOR 33 OHM 1/4W 10% COMP | 01121 | RCR07G330KS |
| R64 | 80997 | RESISTOR 2.00K OHM RN60C 1% MTL FLM | | RN60C2001F |
| R65 | 71993 | RESISTOR 3.9K OHM 1/4W 10% COMP | 01121 | RCR07G392KS |
| R66 | 77524 | RESISTOR 75 OHM 1/4W 5% COMP | 01121 | RCR07G750JS |
| T01 | 84092 | XFMR MATCHING .15-400 MHZ 50 IN 50 OUT | | T1-1 |
| T02 | 84093 | XFMR MATCHING .2-350 MHZ 50 IN 200CT OUT | | T4-1 |
| U01 | 82478 | IC OP AMP LOW NOISE 7 MHZ TO-5 INT.COMP | 04713 | MC1456G |
| U02 | 78219 | IC TEMP CONT DIFF PAIR 726C EQ | 13715 | 726 HC |
| U03 | 78715 | IC DIFF CASCODE RF AMPL | 79089 | CA3028A |
| W01 | 148697 | WIRING HARNESS - BB CONVERTER | | |
| W01P1 | 82953 | CONN MISC BODY W/O INSERTS 10 HOLES | 00779 | 87133-5 |

BASEBAND CONVERTER MODULE ASSY.

REF DESIG PREFIX A05

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| Y01 | 149742 | XTAL, 29.69727MHZ SERIES SPEC CONTRL DWG | | |
| Y02 | 148534 | FILTER, XTAL 30MHZ SOURCE CONTROL DWG | | |

302 KHZ IF MODULE ASSY

REF DESIG PREFIX A06

| COMP DESIG | S-A PART NO. | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| C01 | 78813 | CAPACITR 270 PF 500V SILVER MICA 1% | 84171 | DM-15-271F |
| C02 | 80142 | CAPACITR 20 PF 500V SILVER MICA 5% | 14655 | CD15ED200J |
| C03 | 78700 | FACTORY SELECTED VALUE | | |
| C04 | 84972 | CAPACITR .0013 MF 500V SILVER MICA 1% | | D195E132FO |
| C05 | 84386 | CAPACITR 91 PF 500V SILVER MICA 1% | 14655 | CD15FD910F03 |
| C06 | 84970 | CAPACITR 27 PF 500V SILVER MICA 2% | | D155E270GO |
| C07 | 80923 | CAPACITR 130 PF 500V SILVER MICA 1% | 84171 | DM15-131F |
| C08 | 84972 | CAPACITR .0013 MF 500V SILVER MICA 1% | | D195E132FO |
| C09 | 78700 | FACTORY SELECTED VALUE | | |
| C10 | 84386 | CAPACITR 91 PF 500V SILVER MICA 1% | 14655 | CD15FD910F03 |
| C11 | 85137 | CAPACITR 189 PF 500V SILVER MICA 1% | | D15 BY DESCRIPTION |
| C12 | 84972 | CAPACITR .0013 MF 500V SILVER MICA 1% | | D195E132FO |
| C13 | 78700 | FACTORY SELECTED VALUE | | |
| C14 | 84971 | CAPACITR 62 PF 500V SILVER MICA 1% | | D155E620FO |
| C15 | 78804 | CAPACITR 170 PF 500V SILVER MICA 1% | 84171 | DM-15-171F |
| C16 | 84972 | CAPACITR .0013 MF 500V SILVER MICA 1% | | D195E132FO |
| C17 | 84388 | CAPACITR 91 PF 500V SILVER MICA 1% | 14655 | CD15FD910F03 |
| C18 | 80142 | CAPACITR 20 PF 500V SILVER MICA 5% | 14655 | CD15ED200J |
| C19 | 79803 | CAPACITR 150 PF 500V SILVER MICA 1% | 84171 | DM-15-151F |
| C20 | 84972 | CAPACITR .0013 MF 500V SILVER MICA 1% | | D195E132FO |
| C21 | 78700 | FACTORY SELECTED VALUE | | |
| C22 | 82399 | CAPACITR 75 PF 500V SILVER MICA 1% | 84171 | DM-15-750F |
| C23 | 81827 | CAPACITR 160 PF 100V SILVER MICA 2% | 53021 | D151C161GO3 |
| C24 | 84972 | CAPACITR .0013 MF 500V SILVER MICA 1% | | D195E132FO |
| C25 | 82400 | CAPACITR 82 PF 500V SILVER MICA 1% | 84171 | DM-15-820F |
| C26 | 80142 | CAPACITR 20 PF 500V SILVER MICA 5% | 14655 | CD15ED200J |
| C27 | 73494 | CAPACITR 22 PF 500V SILVER MICA 5% | 14655 | CD15ED220J03 |
| C28 | 84972 | CAPACITR .0013 MF 500V SILVER MICA 1% | | D195E132FO |
| C29 | 78808 | CAPACITR 220 PF 500V SILVER MICA 1% | 84171 | DM-15-221F |
| C30 | 77369 | CAPACITR 47 PF 500V SILVER MICA 2% | 14655 | CD6ED470GO3 |
| C31 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C32 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C33 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C34 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C35 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C36 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C37 | 82394 | CAPACITR 510 PF 100V SILVER MICA 5% | 53021 | D151F511JO |
| C38 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C39 | 70517 | CAPACITR 100 PF 500V SILVER MICA 5% | 14655 | CD15FD101J03 |
| C40 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C41 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C42 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C43 | 84973 | CAPACITR .0016 MF 500V SILVER MICA 1% | | D195E162FO |
| C44 | 81833 | CAPACITR 73 PF 500V SILVER MICA 2% | 53021 | D155C730GO3 |
| C45 | 82972 | CAPACITR .0082 MF 500V SILVER MICA 1% | 53021 | D305F822FO |
| C46 | 85135 | CAPACITR 592 PF 300V SILVER MICA 1% | | D15 BY DESCRIPTION |
| C47 | 80146 | CAPACITR 675 PF 500V SILVER MICA 1% | 84171 | DM15 |
| C48 | 77955 | CAPACITR 3 PF 500V SILVER MICA +-1PF | 14655 | CD6CD030C03 |
| C49 | 80769 | CAPACITR .0091 MF 100V SILVER MICA 1% | 84171 | DM20-912F |
| C50 | 78819 | CAPACITR 470 PF 500V SILVER MICA 1% | 84171 | DM-15-471F |
| C51 | 78700 | FACTORY SELECTED VALUE | | |
| C52 | 82401 | CAPACITR 400 PF 500V SILVER MICA 1% | 84171 | DM-15-401F |
| C53 | 80769 | CAPACITR .0091 MF 100V SILVER MICA 1% | 84171 | DM20-912F |
| C54 | 82402 | CAPACITR 680 PF 500V SILVER MICA 1% | 84171 | DM-15-681F |
| C55 | 78819 | CAPACITR 470 PF 500V SILVER MICA 1% | 84171 | DM-15-471F |
| C56 | 77955 | CAPACITR 3 PF 500V SILVER MICA +-1PF | 14655 | CD6CD030C03 |
| C57 | 80769 | CAPACITR .0091 MF 100V SILVER MICA 1% | 84171 | DM20-912F |
| C58 | 85136 | CAPACITR 650 PF 300V SILVER MICA 1% | | D15 BY DESCRIPTION |
| C59 | 80144 | CAPACITR 430 PF 500V SILVER MICA 1% | 84171 | DM15-431F |
| C60 | 81829 | CAPACITR 15 PF 500V SILVER MICA 2% | 53021 | D155C150GO3 |
| C61 | 80769 | CAPACITR .0091 MF 100V SILVER MICA 1% | 84171 | DM20-912F |
| C62 | 78819 | CAPACITR 470 PF 500V SILVER MICA 1% | 84171 | DM-15-471F |
| C63 | 82401 | CAPACITR 400 PF 500V SILVER MICA 1% | 84171 | DM-15-401F |
| C64 | 78810 | CAPACITR 240 PF 500V SILVER MICA 1% | 84171 | DM-15-241F |
| C65 | 82972 | CAPACITR .0082 MF 500V SILVER MICA 1% | 53021 | D305F822FO |
| C66 | 76486 | CAPACITR 560 PF 500V SILVER MICA 5% | 14655 | CD19FD561J03 |
| C67 | 84974 | CAPACITR .0018 MF 500V SILVER MICA 1% | | D195E182FO |
| C68 | 81827 | CAPACITR 160 PF 100V SILVER MICA 2% | 53021 | D151C161GO3 |
| C69 | 76469 | CAPACITR 10 PF 500V SILVER MICA 5% | 84171 | DM10-100J |
| C70 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C71 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C72 | 70470 | CAPACITR 10 PF 500V SILVER MICA 5% | 14655 | CD15CD100J03 |

302 KHZ IF MODULE ASSY

REF DESIG PREFIX A06

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| A74 | | | | |
| L01 | 147521 | COIL ASSY 30-KHZ BANDPASS FILTER | | |
| L02 | 147521 | COIL ASSY 30-KHZ BANDPASS FILTER | | |
| L03 | 147521 | COIL ASSY 30-KHZ BANDPASS FILTER | | |
| L04 | 147521 | COIL ASSY 30-KHZ BANDPASS FILTER | | |
| L05 | 147521 | COIL ASSY 30-KHZ BANDPASS FILTER | | |
| L06 | 147521 | COIL ASSY 30-KHZ BANDPASS FILTER | | |
| L07 | 147521 | COIL ASSY 30-KHZ BANDPASS FILTER | | |
| L08 | 147522 | COIL ASSY 1.74-KHZ BANDPASS FILTER | | |
| L09 | 147522 | COIL ASSY 1.74-KHZ BANDPASS FILTER | | |
| L10 | 147522 | COIL ASSY 1.74-KHZ BANDPASS FILTER | | |
| L11 | 147522 | COIL ASSY 1.74-KHZ BANDPASS FILTER | | |
| L12 | 147522 | COIL ASSY 1.74-KHZ BANDPASS FILTER | | |
| L13 | 147522 | COIL ASSY 1.74-KHZ BANDPASS FILTER | | |
| L14 | 78716 | INDUCTOR 100 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L15 | 78716 | INDUCTOR 100 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| P01 | 82953 | CONN MISC BODY W/O INSERTS 10 HOLES | 00779 | 87133-5 |
| R01 | 84872 | RESISTOR 931 OHM RN55C 1% MTL FLM | | RN55C9310F |
| R02 | 78926 | RESISTOR 1.00K OHM RN55C 1% MTL FLM | | RN55C1001F |
| R03 | 71913 | RESISTOR 270 OHM 1/4W 10% COMP | 01121 | RCR07G271KS |
| R04 | 71913 | RESISTOR 270 OHM 1/4W 10% COMP | 01121 | RCR07G271KS |
| R05 | 71977 | RESISTOR 2.2K OHM 1/4W 10% COMP | 01121 | RCR07G222KS |
| R06 | 83894 | RESISTOR 1.78K OHM RN55C 1% MTL FLM | | RN55C1781F |
| R07 | 83907 | RESISTOR 4.22K OHM RN55C 1% MTL FLM | | RN55C4221F |
| R08 | 83837 | RESISTOR 1.27K OHM RN55C 1% MTL FLM | | RN55C1271F |
| R09 | 71951 | RESISTOR 1.0K OHM 1/4W 10% COMP | 01121 | RCR07G102KS |
| R10 | 83911 | RESISTOR 5.62K OHM RN55C 1% MTL FLM | | RN55C5621F |
| R11 | 83911 | RESISTOR 5.62K OHM RN55C 1% MTL FLM | | RN55C5621F |
| R12 | 83917 | RESISTOR 11.5K OHM RN55C 1% MTL FLM | | RN55C1152F |
| R13 | 83832 | RESISTOR 909 OHM RN55C 1% MTL FLM | | RN55C9090F |
| R14 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| R15 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R16 | 78931 | RESISTOR 4.99K OHM RN55C 1% MTL FLM | | RN55C4991F |
| R17 | 78931 | RESISTOR 4.99K OHM RN55C 1% MTL FLM | | RN55C4991F |
| R18 | 83894 | RESISTOR 1.78K OHM RN55C 1% MTL FLM | | RN55C1781F |
| R19 | 84884 | POT 5K OHM 1/2W CERMET 20T PC MT 3/8 SQ | | 66WR5K |
| R20 | 78924 | RESISTOR 20.0K OHM RN55C 1% MTL FLM | | RN55C2002F |
| R21 | 84884 | POT 5K OHM 1/2W CERMET 20T PC MT 3/8 SQ | | 66WR5K |
| R22 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R23 | 71941 | RESISTOR 820 OHM 1/4W 10% COMP | 01121 | RCR07G821KS |
| R24 | 71940 | RESISTOR 1.2K OHM 1/4W 10% COMP | 01121 | RCR07G122KS |
| R25 | 83039 | RESISTOR 75.0 OHM RN55C 1% MTL FLM | | RN55C75R0F |
| R26 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| R27 | 79984 | RESISTOR 4.02K OHM RN55C 1% MTL FLM | | RN55C4021F |
| U01 | 73715 | IC DIFF CASCODE RF AMPL | 79089 | CA3028A |
| U02 | 84683 | IC CMOS QUAD ANALOG SWITCH | | MC14066CP |
| U03 | 84683 | IC CMOS QUAD ANALOG SWITCH | | MC14066CP |
| U04 | 84886 | IC OP AMP WIDEBAND 8-PIN DIP | | LM318N |
| U05 | 83014 | IC CMOS HEX INVERTER/BUFFER | 04713 | MC14049CP |
| U06 | 84683 | IC CMOS QUAD ANALOG SWITCH | | MC14066CP |
| U07 | 84886 | IC OP AMP WIDEBAND 8-PIN DIP | | LM318N |
| W01 | 148746 | WIRING HARNESS - 302 KHZ | | |

PWR ASSY, LAMP LOGIC

REF DESIG PREFIX A07

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| A01 | 147679 | PWR ASSY, INTERLOCK LOGIC | | |
| A01C1 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| A01J1 | 84571 | CONN RECT 28 PINS PC MT | 00779 | 86418-3 |
| A01J2 | | NOT ASSIGNED | | |
| A01J3 | 85128 | CONN HEADER DBL ROW STRAIGHT 28-PIN PC | | 1-87227-4 |
| A01P1 | 85128 | CONN HEADER DBL ROW STRAIGHT 28-PIN PC | | 1-87227-4 |
| A01R1 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| A01U1 | 85131 | IC CMOS 8-IN NAND GATE | | MC14068CP |
| A01U2 | 85131 | IC CMOS 8-IN NAND GATE | | MC14068CP |
| A01U3 | 85131 | IC CMOS 8-IN NAND GATE | | MC14068CP |
| A01U4 | 85131 | IC CMOS 8-IN NAND GATE | | MC14068CP |
| A01U5 | 85131 | IC CMOS 8-IN NAND GATE | | MC14068CP |
| A01U6 | 85131 | IC CMOS 8-IN NAND GATE | | MC14068CP |
| A01U7 | 83014 | IC CMOS HEX INVERTER/BUFFER | 04713 | MC14049CP |
| C01 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C02 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C03 | 77920 | CAPACITR 1 MF 50V CER MONO 20% | 80183 | 5C023105X0500C5 |
| C04 | 35656 | CAPACITR 100 MF 20V SOLID TANT POL 10% | 05397 | T362D107K020AS |
| C05 | 35656 | CAPACITR 100 MF 20V SOLID TANT POL 10% | 05397 | T362D107K020AS |
| J01 | 84930 | CONN HEADER DBL ROW STRAIGHT 20-PIN PC | | 1-87227-0 |
| J02 | 85128 | CONN HEADER DBL ROW STRAIGHT 28-PIN PC | | 1-87227-4 |
| J03 | 84571 | CONN RECT 28 PINS PC MT | 00779 | 86418-3 |
| J04 | 84930 | CONN HEADER DBL ROW STRAIGHT 20-PIN PC | | 1-87227-0 |
| Q01 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q02 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q03 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q04 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q05 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q06 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q07 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q08 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q09 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| R01 | 79927 | RESISTOR 33K OHM 1/8W 5% COMP | 01121 | RCR05G333JS |
| R02 | 78272 | RESISTOR 12 OHM 1/8W 5% COMP | 01121 | RCR05G120JS |
| R03 | 78070 | RESISTOR 4.7K OHM 1/8W 5% COMP | 01121 | RCR05G472JS |
| R04 | 79927 | RESISTOR 33K OHM 1/8W 5% COMP | 01121 | RCR05G333JS |
| R05 | 78272 | RESISTOR 12 OHM 1/8W 5% COMP | 01121 | RCR05G120JS |
| R06 | 78070 | RESISTOR 4.7K OHM 1/8W 5% COMP | 01121 | RCR05G472JS |
| R07 | 79927 | RESISTOR 33K OHM 1/8W 5% COMP | 01121 | RCR05G333JS |
| R08 | 78272 | RESISTOR 12 OHM 1/8W 5% COMP | 01121 | RCR05G120JS |
| R09 | 78070 | RESISTOR 4.7K OHM 1/8W 5% COMP | 01121 | RCR05G472JS |
| R10 | 79927 | RESISTOR 33K OHM 1/8W 5% COMP | 01121 | RCR05G333JS |
| R11 | 78272 | RESISTOR 12 OHM 1/8W 5% COMP | 01121 | RCR05G120JS |
| R12 | 78070 | RESISTOR 4.7K OHM 1/8W 5% COMP | 01121 | RCR05G472JS |
| R13 | 79927 | RESISTOR 33K OHM 1/8W 5% COMP | 01121 | RCR05G333JS |
| R14 | 78272 | RESISTOR 12 OHM 1/8W 5% COMP | 01121 | RCR05G120JS |
| R15 | 78070 | RESISTOR 4.7K OHM 1/8W 5% COMP | 01121 | RCR05G472JS |
| R16 | 79927 | RESISTOR 33K OHM 1/8W 5% COMP | 01121 | RCR05G333JS |
| R17 | 78272 | RESISTOR 12 OHM 1/8W 5% COMP | 01121 | RCR05G120JS |
| R18 | 78070 | RESISTOR 4.7K OHM 1/8W 5% COMP | 01121 | RCR05G472JS |
| R19 | 79927 | RESISTOR 33K OHM 1/8W 5% COMP | 01121 | RCR05G333JS |
| R20 | 78272 | RESISTOR 12 OHM 1/8W 5% COMP | 01121 | RCR05G120JS |
| R21 | 78070 | RESISTOR 4.7K OHM 1/8W 5% COMP | 01121 | RCR05G472JS |
| R22 | 79927 | RESISTOR 33K OHM 1/8W 5% COMP | 01121 | RCR05G333JS |
| R23 | 78272 | RESISTOR 12 OHM 1/8W 5% COMP | 01121 | RCR05G120JS |
| R24 | 78070 | RESISTOR 4.7K OHM 1/8W 5% COMP | 01121 | RCR05G4,2JS |
| R25 | 79927 | RESISTOR 33K OHM 1/8W 5% COMP | 01121 | RCR05G333JS |

PWR ASSY, LAMP LOGIC

REF DESIG PREFIX A07

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| R26 | 78272 | RESISTOR 12 OHM 1/8W 5% COMP | 01121 | RCR05G120JS |
| R27 | 78070 | RESISTOR 4.7K OHM 1/8W 5% COMP | 01121 | RCR05G472JS |
| R28 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| R29 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| R30 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| R31 | 72123 | RESISTOR 150K OHM 1/4W 10% COMP | 01121 | RCR07G154KS |
| R32 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R33 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| U02 | 83016 | IC CMOS QUAD 2-IN NAND GATE | 04713 | MC14011CP |
| U03 | 83017 | IC CMOS QUAD 2-IN NOR GATE | 04713 | MC14001CP |
| U04 | 83011 | IC CMOS DUAL TYPE D FLIP-FLOP | 04713 | MC14013CP |

IF/RF ANALYZER, MODEL 4670-1 ASSY, REAR PANEL

REF DESIG PREFIX A08

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| J01 | 85126 | CONN HEADER DBL ROW STRAIGHT 10-PIN PC | | 87227-5 |
| J02 | 85126 | CONN HEADER DBL ROW STRAIGHT 10-PIN PC | | 87227-5 |
| J03 | 85126 | CONN HEADER DBL ROW STRAIGHT 10-PIN PC | | 87227-5 |
| J04 | 85126 | CONN HEADER DBL ROW STRAIGHT 10-PIN PC | | 87227-5 |
| J05 | 85126 | CONN HEADER DBL ROW STRAIGHT 10-PIN PC | | 87227-5 |
| R01 | 83894 | RESISTOR 1.78K OHM RN55C 1% MTL FLM | | RN55C1781F |
| R02 | 83894 | RESISTOR 1.78K OHM RN55C 1% MTL FLM | | RN55C1781F |
| TB01 | 75899 | TERMINAL STRIP 5 LUG CENTER GROUND | 71785 | 54C |
| W15 | 148663 | WIRING HARNESS - RECORDER | | |
| W15P1 | 82953 | CONN MISC BODY W/O INSERTS 10 HOLES | 00779 | 87133-5 |
| W15P2 | 85051 | CONN RECT 14-COND FEM CBL MT | | 552300-1 |
| W21 | 147665 | WIRING HARNESS - REAR PANEL | | |
| W21P1 | 82954 | CONN MISC BODY W/O INSERTS 20 HOLES | 00779 | 87133-6 |
| W21P2 | 84996 | CONN RECT BODY W/O CONTACTS 12 POS RECEP | | 03-06-1122 |

MDL 4673-1 TE/BR ANALYZER, FRONT PNL.

REF DESIG PREFIX A09

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| MO1 | 148759 | METER, LEVEL - SPEC CONTROL DWG | | |
| S01 | 84822 | SWITCH TOG DPDT FLAT TOG 5A 120VAC | | 7201PYPZG |
| S02 | 85120 | SWITCH TOG SPDT FLAT TOG 5A 115VAC | | 7105PYPZG |
| S03 | 85120 | SWITCH TOG SPDT FLAT TOG 5A 115VAC | | 7105PYPZG |
| S04 | 85120 | SWITCH TOG SPDT FLAT TOG 5A 115VAC | | 7105PYPZG |
| S05 | 85120 | SWITCH TOG SPDT FLAT TOG 5A 115VAC | | 7105PYPZG |
| S06 | 85120 | SWITCH TOG SPDT FLAT TOG 5A 115VAC | | 7105PYPZG |
| S07 | 85120 | SWITCH TOG SPDT FLAT TOG 5A 115VAC | | 7105PYPZG |
| S08 | 85120 | SWITCH TOG SPDT FLAT TOG 5A 115VAC | | 7105PYPZG |
| S09 | 85120 | SWITCH TOG SPDT FLAT TOG 5A 115VAC | | 7105PYPZG |
| S10 | 85120 | SWITCH TOG SPDT FLAT TOG 5A 115VAC | | 7105PYPZG |
| S11 | 85120 | SWITCH TOG SPDT FLAT TOG 5A 115VAC | | 7105PYPZG |
| W16 | 148562 | WIRING HARNESS FRONT PANEL INTERFACE | | |
| W16P1 | 82953 | CONN MISC BODY W/O INSERTS 10 HOLES | 00779 | 87133-5 |

DE-EMPHYSIS NETWORK MODULE ASSY.

REF DESIG PREFIX A10

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| C01 | 82969 | CAPACITR .001 MF 500V SILVER MICA 1% | 53021 | D195F102F0 |
| C02 | 73496 | CAPACITR 56 PF 500V SILVER MICA 5% | 14655 | CD15ED560J03 |
| J01 | 148743 | JACK, W.E. MINIATURE SPEC CONTROL DWG | | |
| J02 | 148743 | JACK, W.E. MINIATURE SPEC CONTROL DWG | | |
| J03 | 148743 | JACK, W.E. MINIATURE SPEC CONTROL DWG | | |
| J04 | 148743 | JACK, W.E. MINIATURE SPEC CONTROL DWG | | |
| J05 | 148743 | JACK, W.E. MINIATURE SPEC CONTROL DWG | | |
| J06 | 148743 | JACK, W.E. MINIATURE SPEC CONTROL DWG | | |
| L01 | 147523 | COIL ASSY DE-EMPHASIS NETWORK | | |
| R01 | 85075 | RESISTOR 49.9 OHM RN55C .25% MTL FLM | | RN55C49R9C |
| R02 | 85075 | RESISTOR 49.9 OHM RN55C .25% MTL FLM | | RN55C49R9C |
| R03 | 82174 | RESISTOR 402K OHM RN60C 1% MTL FLM | | RN60C4023F |
| R04 | 85076 | RESISTOR 31.6 OHM RN55C .25% MTL FLM | | RN55C31R6C |
| T01 | 147736 | XFMR, 75/124 OHM SPEC CONTROL DWG | | |

ATTENUATOR LOGIC PWB. ASSY.

REF DESIG PREFIX A11

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR02 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR03 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR04 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR05 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR06 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR07 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR08 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR09 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR10 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR11 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR12 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR13 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR14 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR15 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR16 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR17 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR18 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR19 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| CR20 | 71142 | DIODE 1N4154 SIL 25V 150MA | 80368 | 1N4154 |
| J01 | 84585 | CONN HEADER DBL ROW RT ANGLE 10-PIN PC | 00779 | 87230-5 |
| J02 | 34337 | CONN HEADER DBL ROW RT ANGLE 20-PIN PC | 00779 | 1-87230-0 |
| Q01 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q02 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q03 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q04 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q05 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q06 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| R01 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R02 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R03 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R04 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| S01 | 84484 | SWITCH ROT 1P 3 POS NSH | | 5-11371-347 |
| S02 | 85121 | SWITCH ROT 1P 11 POS NSH 1 SEC 30 DEG | | 512451349 |
| S03 | 85122 | SWITCH ROT 1P 5 POS NSH 1 SEC 30 DEG | | 511731346 |
| S04 | 85121 | SWITCH ROT 1P 11 POS NSH 1 SEC 30 DEG | | 512451349 |
| U01 | 84959 | IC CMOS 4-BIT FULL ADDER | | MC14008CP |
| U02 | 84688 | IC CMOS PRIORITY ENCODER | | MC14532CP |
| U03 | 84950 | RESISTOR NETWORK 13 100K OHM 10% 14 DIP | | 34A1041 |
| U04 | 84949 | RESISTOR NETWORK 7 100K OHM 10% 14 DIP | | 34B1041 |
| U05 | 84959 | IC CMOS 4-BIT FULL ADDER | | MC14008CP |
| U06 | 84688 | IC CMOS PRIORITY ENCODER | | MC14532CP |
| U07 | 84950 | RESISTOR NETWORK 13 100K OHM 10% 14 DIP | | 34A1041 |

PWR ASSY, DISPLAY INTERFACE

REF DESIG PREFIX A12

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| C01 | 70518 | CAPACITR 100 PF 1KV CER DISC | 71590 | DD-101 |
| C02 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C03 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C04 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C05 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C06 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C07 | 35556 | CAPACITR 100 MF 20V SOLID TANT POL 10% | 05397 | T362D107K020AS |
| J01 | 84571 | CONN RECT 28 PINS PC MT | 00779 | 86418-3 |
| J02 | 84571 | CONN RECT 28 PINS PC MT | 00779 | 86418-3 |
| J03 | 84571 | CONN RECT 28 PINS PC MT | 00779 | 86418-3 |
| J04 | 84030 | CONN HEADER DBL ROW STRAIGHT 20-PIN PC | | 1-87227-0 |
| Q01 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q02 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q03 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q04 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q05 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q06 | 84815 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| R01 | 72077 | RESISTOR 47K OHM 1/4W 10% COMP | 01121 | RCR07G473KS |
| R02 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R03 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R04 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R05 | 72182 | RESISTOR 820K OHM 1/4W 10% COMP | 01121 | RCR07G824KS |
| R06 | 72189 | RESISTOR 1.0 MEG 1/4W 10% COMP | 01121 | RCR07G105KS |
| R07 | 72182 | RESISTOR 820K OHM 1/4W 10% COMP | 01121 | RCR07G824KS |
| R08 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R09 | 72064 | RESISTOR 33K OHM 1/4W 10% COMP | 01121 | RCR07G333KS |
| R10 | 76277 | RESISTOR 12 OHM 1/4W 10% COMP | 01121 | RCR07G120KS |
| R11 | 72002 | RESISTOR 4.7K OHM 1/4W 10% COMP | 01121 | RCR07G472KS |
| R12 | 72064 | RESISTOR 33K OHM 1/4W 10% COMP | 01121 | RCR07G333KS |
| R13 | 76277 | RESISTOR 12 OHM 1/4W 10% COMP | 01121 | RCR07G120KS |
| R14 | 72002 | RESISTOR 4.7K OHM 1/4W 10% COMP | 01121 | RCR07G472KS |
| SW01 | 85163 | SWITCH PUSHB SPST MOM PC MT | | 8125V |
| U01 | 83060 | IC CMOS DUAL 4-BIT SHIFT REGISTER | 04713 | MC14015CP |
| U02 | 83060 | IC CMOS DUAL 4-BIT SHIFT REGISTER | 04713 | MC14015CP |
| U03 | 83060 | IC CMOS DUAL 4-BIT SHIFT REGISTER | 04713 | MC14015CP |
| U04 | 84510 | IC CMOS QUAD CLOCKED D LATCH | 79089 | CD4042AE |
| U05 | 83060 | IC CMOS DUAL 4-BIT SHIFT REGISTER | 04713 | MC14015CP |
| U06 | 83060 | IC CMOS DUAL 4-BIT SHIFT REGISTER | 04713 | MC14015CP |
| U07 | 83060 | IC CMOS DUAL 4-BIT SHIFT REGISTER | 04713 | MC14015CP |
| U08 | 84510 | IC CMOS QUAD CLOCKED D LATCH | 79089 | CD4042AE |
| U09 | 83623 | IC CMOS DUAL MONOSTABLE MULTI | 04713 | MC14528CP |
| U10 | 83011 | IC CMOS DUAL TYPE D FLIP-FLOP | 04713 | MC14013CP |
| U11 | 83016 | IC CMOS QUAD 2-IN NAND GATE | 04713 | MC14011CP |

## BASEBAND LOCAL OSCILLATOR MODULE ASSY

REF DESIG PREFIX A13

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| CR01 | 82396 | DIODE MV3142 VARACTOR SIL RIBBON LEADS | 04713 | MV3142 |
| CR02 | 83418 | DIODE 5082-2800 DET UHF SCHOTTKY | 28480 | 5082-2800 |
| CR03 | 85003 | DIODE MV209 VARACTOR SIL RADIAL LEADS | | MV209 |
| CR04 | 85003 | DIODE MV209 VARACTOR SIL RADIAL LEADS | | MV209 |
| CR05 | 85003 | DIODE MV209 VARACTOR SIL RADIAL LEADS | | MV209 |
| CR06 | 85003 | DIODE MV209 VARACTOR SIL RADIAL LEADS | | MV209 |
| CR07 | 78763 | DIODE 1N4740A SI ZEN 10V 5% 1W | 04713 | 1N4740A |
| C01 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C02 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C03 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C04 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C05 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C06 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C07 | 81111 | CAPACITR 1 MF 50V CER MONO 20% | 72982 | 8131-050-651-105M |
| C08 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C09 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C10 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C11 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C12 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C13 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C14 | 92004 | CAPACITR 3.3 PF 100V CER DISC | 72982 | 835-024-COJO-339C |
| C15 | 81746 | CAPACITR 1 PF 500V CER DISC | 72982 | 831-COKO-109C |
| C16 | 73494 | CAPACITR 22 PF 500V SILVER MICA 5% | 14655 | CD15ED220J03 |
| C17 | 79143 | CAPACITR 2-8 PF MIN CER DISC PC MT | 72982 | 538-011 A 2-8 |
| C18 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C19 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C20 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C21 | 70470 | CAPACITR 10 PF 500V SILVER MICA 5% | 14655 | CD15CD100J03 |
| C22 | 70493 | CAPACITR 33 PF 500V SILVER MICA 5% | 14655 | CD15ED330J03 |
| C23 | 81971 | CAPACITR 2.2 PF 100V CER DISC | 72982 | 835-024-COGO229B |
| C24 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C25 | 35654 | CAPACITR 10 MF 25V SOLID TANT POL 10% | 05397 | T362B106K025AS |
| C26 | 81995 | CAPACITR .001 MF 100V CER MONO X7R 10% | 72982 | 8121-100-X7R-102K |
| C27 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C28 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C29 | 80139 | CAPACITR .1 MF 50V CER MONO | 72982 | 8131-050-651-104Z |
| C30 | | NOT ASSIGNED | | |
| C31 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| C32 | 81995 | CAPACITR .001 MF 100V CER MONO X7R 10% | 72982 | 8121-100-X7R-102K |
| C33 | 81995 | CAPACITR .001 MF 100V CER MONO X7R 10% | 72982 | 8121-100-X7R-102K |
| C34 | 81210 | CAPACITR .01 MF 50V CER MONO X7R 10% | 72982 | 8121-050-X7R-103K |
| E01 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| E02 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| E03 | 77863 | CAPACITR .001 MF 500V FDTHRU THD GMV | 33095 | 54-804-002-102P |
| E04 | 81718 | CORE BEAD FERRITE 7D .138X.037X.150L | 78488 | 57-1413 |
| E05 | 81718 | CORE BEAD FERRITE 7D .138X.037X.150L | 78488 | 57-1413 |
| E06 | 81718 | CORE BEAD FERRITE 7D .138X.037X.150L | 78488 | 57-1413 |
| E07 | 81718 | CORE BEAD FERRITE 7D .138X.037X.150L | 78488 | 57-1413 |
| E08 | 81718 | CORE BEAD FERRITE 7D .138X.037X.150L | 78488 | 57-1413 |
| E09 | 81718 | CORE BEAD FERRITE 7D .138X.037X.150L | 78488 | 57-1413 |
| J01 | 84937 | CONN COAX CONHX SNAP-ON MALE TO SLDR CUP | | 51-145-0000 |
| J02 | 84937 | CONN COAX CONHX SNAP-ON MALE TO SLDR CUP | | 51-145-0000 |
| J03 | 85125 | CONN HEADER DBL ROW STRAIGHT 4-PIN PC | | 87227-2 |
| J04 | 84937 | CONN COAX CONHX SNAP-ON MALE TO SLDR CUP | | 51-145-0000 |
| K01 | 85052 | RELAY 12VDC TO-5 PKG | | 7320-12 |
| L01 | 79926 | INDUCTOR 10 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L02 | 80331 | INDUCTOR .25 UH MIN MET ON GLASS PC MT | 73899 | LF2W025 |
| L03 | 79926 | INDUCTOR 10 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L04 | 79926 | INDUCTOR 10 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L05 | 79698 | INDUCTOR .30 UH MIN MET ON GLASS PC MT | 73899 | LF2W030 |
| L06 | 70736 | INDUCTOR 33 UH SUBMIN UNSHLD MOLDED 10% | 76493 | 9310-52 |
| L07 | 70736 | INDUCTOR 33 UH SUBMIN UNSHLD MOLDED 10% | 76493 | 9310-52 |
| L08 | 79926 | INDUCTOR 10 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |

BASEBAND LOCAL OSCILLATOR MODULE ASSY

REF DESIG PREFIX A13

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| L09 | 79926 | INDUCTOR 10 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L10 | 79926 | INDUCTOR 10 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| L11 | 79926 | INDUCTOR 10 UH SUBMIN UNSHLD 10% | 91637 | IR-2 |
| Q01 | 84315 | TRANSSTR 2N6427 NPN SIL DARLINGTON PAIR | | 2N6427 |
| Q02 | 35649 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q03 | 35649 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q04 | 35649 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q05 | 35649 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q06 | 35649 | TRANSSTR 2N5179 SIL NPN | 04713 | 2N5179 |
| Q07 | 79329 | TRANSSTR 2N5109 NPN SIL | 79089 | 2N5109 |
| R01 | 72147 | RESISTOR 270K OHM 1/4W 10% COMP | 01121 | RCR07G274KS |
| R02 | 71941 | RESISTOR 820 OHM 1/4W 10% COMP | 01121 | RCR07G821KS |
| R03 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R04 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R05 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R06 | 72113 | RESISTOR 100K OHM 1/4W 10% COMP | 01121 | RCR07G104KS |
| R07 | 72116 | RESISTOR 120K OHM 1/4W 10% COMP | 01121 | RCR07G124KS |
| R08 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R09 | 72039 | RESISTOR 15K OHM 1/4W 10% COMP | 01121 | RCR07G153KS |
| R10 | 71907 | RESISTOR 220 OHM 1/4W 10% COMP | 01121 | RCR07G221KS |
| R11 | | NOT ASSIGNED | | |
| R12 | 72068 | RESISTOR 39K OHM 1/4W 10% COMP | 01121 | RCR07G393KS |
| R13 | 72046 | RESISTOR 18K OHM 1/4W 10% COMP | 01121 | RCR07G183KS |
| R14 | 71807 | RESISTOR 150 OHM 1/4W 10% COMP | 01121 | RCR07G151KS |
| R15 | 71887 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R16 | 71837 | RESISTOR 100 OHM 1/4W 10% COMP | 01121 | RCR07G101KS |
| R17 | 71960 | RESISTOR 1.2K OHM 1/4W 10% COMP | 01121 | RCR07G122KS |
| R18 | 79010 | RESISTOR 590 OHM RN55C 1% MTL FLM | | RN55C5900F |
| R19 | 71941 | RESISTOR 820 OHM 1/4W 10% COMP | 01121 | RCR07G821KS |
| R20 | 79123 | RESISTOR 301 OHM RN55C 1% MTL FLM | | RN55C3010F |
| R21 | 83039 | RESISTOR 75.0 OHM RN55C 1% MTL FLM | | RN55C75R0F |
| R22 | 78457 | RESISTOR 590 OHM RN60C 1% MTL FLM | | RN60C5900F |
| R23 | 83301 | RESISTOR 150 OHM RN55C 1% MTL FLM | | RN55C1500F |
| R24 | 83801 | RESISTOR 150 OHM RN55C 1% MTL FLM | | RN55C1500F |
| R25 | 72034 | RESISTOR 12K OHM 1/4W 10% COMP | 01121 | RCR07G123KS |
| R26 | 71977 | RESISTOR 2.2K OHM 1/4W 10% COMP | 01121 | RCR07G222KS |
| R27 | 72014 | RESISTOR 6.8K OHM 1/4W 10% COMP | 01121 | RCR07G682KS |
| R28 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| R29 | 78417 | RESISTOR 140K OHM RN55C 1% MTL FLM | | RN55C1402F |
| R30 | 71951 | RESISTOR 1.0K OHM 1/4W 10% COMP | 01121 | RCR07G102KS |
| R31 | 78933 | RESISTOR 10.0K OHM RN55C 1% MTL FLM | | RN55C1002F |
| R32 | 72026 | RESISTOR 10K OHM 1/4W 10% COMP | 01121 | RCR07G103KS |
| U01 | 81840 | IC OP AMP 8PIN DIP INT.COMP. DUAL 741C | 04713 | MC1458P1 |
| U02 | 84890 | IC OP AMP GEN PUR +70C 8-PIN DIP 741C | | MC1741CP1 |
| W19 | 148640 | WIRING HARNESS - PB LC | | |
| W1P1 | 82953 | CONN MISC BODY W/O INSERTS 10 HOLES | 00779 | 87133-5 |

ATTENUATOR MODULE

REF DESIG PREFIX A14

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| T01 | 148638 | POWER XFMR ASSY IF/RF ANALYZR MDL 4670-1 | | |
| T01P1 | 84907 | CONN RECT BODY W/O CONTACTS 12 POS PLUG | | 03-06-2122 |
| W01 | 147643 | CABLE SET, RF | | |
| W01P1 | 84936 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W01P2 | 84939 | CONN COAX CONHX SNAP-ON FEM TO .15 CBL | | 51-124-0000 |
| W02 | 147643 | CABLE SET, RF | | |
| W02P1 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W02P2 | 84939 | CONN COAX CONHX SNAP-ON FEM TO .15 CBL | | 51-124-0000 |
| W03 | 147643 | CABLE SET, RF | | |
| W03P1 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W03P2 | 84939 | CONN COAX CONHX SNAP-ON FEM TO .15 CBL | | 51-124-0000 |
| W04 | | NOT ASSIGNED | | |
| W05 | | NOT ASSIGNED | | |
| W06 | 147767 | CABLE SET, RF | | |
| W06P1 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W06P2 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W07 | 147767 | CABLE SET, RF | | |
| W07P1 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W07P2 | 84939 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W08 | 147767 | CABLE SET, RF | | |
| W08P1 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W08P2 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W09 | 147767 | CABLE SET, RF | | |
| W09P1 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W09P2 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W10 | 147767 | CABLE SET, RF | | |
| W10P1 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W10P2 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W11 | 147767 | CABLE SET, RF | | |
| W11P1 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W11P2 | 84938 | CONN COAX CONHX SNAP-ON FEM ANGL .15 CBL | | 51-128-9511 |
| W12 | 148666 | CABLE, RIBBON ASSY - 30KHZ | | |
| W12P1 | 85050 | CONN FLAT CABLE FEM 26 PIN W/STRN RELIEF | | 86905-2 |
| W12P2 | 85050 | CONN FLAT CABLE FEM 26 PIN W/STRN RELIEF | | 86905-2 |
| W13 | 148665 | CABLE, RIBBON ASSY - LAMP LOGIC PWB | | |
| W13P1 | 85049 | CONN FLAT CABLE FEM 20 PIN W/STRN RELIEF | | 86904-2 |
| W13P2 | 85049 | CONN FLAT CABLE FEM 20 PIN W/STRN RELIEF | | 86904-2 |
| W14 | 148664 | CABLE, RIBBON ASSY - ATTEN LOGIC PWB | | |
| W14P1 | 85049 | CONN FLAT CABLE FEM 20 PIN W/STRN RELIEF | | 86904-2 |
| W14P2 | 85049 | CONN FLAT CABLE FEM 20 PIN W/STRN RELIEF | | 86904-2 |
| W15 | | NOT ASSIGNED | | |
| W16 | | NOT ASSIGNED | | |
| W17 | 148661 | CABLE, RIBBON ASSY - RF INTERFACE PWB | | |
| W17P1 | 85048 | CONN FLAT CABLE FEM 10 PIN W/STRN RELIEF | | 86981-2 |
| W17P2 | 85048 | CONN FLAT CABLE FEM 10 PIN W/STRN RELIEF | | 86981-2 |

ATTENUATOR MODULE

REF DESIG PREFIX A14

| COMP DESIG | S-A PART NO | DESCRIPTION | FSCM | MFR PART NO |
|---|---|---|---|---|
| W18 | | NOT ASSIGNED | | |
| W19 | 148698 | CABLE, RIBBON ASSY - DISPLAY PWB | | |
| W19P1 | 85048 | CONN FLAT CABLE FEM 10 PIN W/STRN RELIEF | | 86981-2 |
| W19P2 | 85048 | CONN FLAT CABLE FEM 10 PIN W/STRN RELIEF | | 86981-2 |
| W20 | | NOT ASSIGNED | | |
| W21 | | NOT ASSIGNED | | |
| W22 | | NOT ASSIGNED | | |
| W23 | 148674 | CABLE RECORDER INTERFACE | | |
| W23P1 | 70821 | CONN RECT 14-COND MALE CABLE MT | 02660 | 57-30140 |
| W23P2 | 70822 | CONN RECT 24-COND MALE CABLE MT | 02660 | 57 30240 |

FSCM-MANUFACTURER CROSS REFERENCE

| FSCM | MANUFACTURER |
|---|---|
| 00656 | |
| 00779 | |
| 01121 | |
| 01295 | |
| 04713 | |
| 12715 | |
| 14655 | |
| 14949 | |
| 24681 | |
| 31718 | |
| 33095 | |
| 37942 | |
| 53021 | |
| 71590 | |
| 72982 | |
| 7[illegible]48P | |
| 7[illegible]0P9 | |
| 80183 | |
| 80368 | |
| 81312 | |
| 8[illegible]003 | |
| 84171 | |
| 91637 | |
| 96927 | |

FSCM-MANUFACTURER CROSS REFERENCE

| FSCM | MANUFACTURER |
|---|---|
| 14655 | |
| 53021 | |
| 80368 | |
| 81312 | |
| 84171 | |
| 86927 | |

# PARTS LIST ABBREVIATIONS

| Abbreviation | Word |
|---|---|
| A | Ampere |
| AC | Alternating current |
| ACT | Action, acting |
| AFC | Automatic frequency control |
| AGC | Automatic gain control |
| AMP, AMPL | Amplifier |
| ANGL | Angle |
| APC | Automatic phase control |
| ASSY | Assembly |
| BCD | Binary-coded-decimal |
| CAP | Capacitance, capacitor |
| CAR | Carbon |
| CBL | Cable |
| CCW | Counterclockwise |
| CDX | Control differential transformer |
| CER | Ceramic |
| CHS | Chassis |
| COAX | Coaxial |
| COMP | Component, composition |
| COND | Conductor |
| CONN | Connector |
| CONT | Contact(s) |
| CPS | See Hertz |
| CRT | Cathode-ray tube |
| CT | Control transformer, center-tapped |
| CTR | Center |
| CW | Continuous-wave, counterclockwise |
| ELECT | Electrolytic, electric(al), electron(ic) |
| ENCAP | Encapsulated |
| FEM | Female |
| FET | Field-effect transistor |
| FLM | Film |
| FTHRU | Feedthrough |
| FUS | Fuse(d) |
| GER | Germanium |
| GHZ | Gigahertz |
| GND | Ground |
| H, HY | Henry |
| HD | Head |
| HEX | Six-sided |
| HLDR | Holder |
| ()-IN | ()-Input(s) |
| IC, INT CKT | Integrated circuit |
| IF | Intermediate frequency |
| IN | Input |
| INC | Incandenscent |
| INTL | Internal |
| JUNC | Junction |
| K | Kilo |
| LATCH | Latch(ing) |
| LCK | Lock, locking |
| M | Milli |
| MA | Milliampere |
| MAX | Maximum |
| MDM | Medium |
| MEG | Million (ohms) |
| MET | Metal |
| MF | Microfarad |
| MHZ | Megahertz |
| MIN | Minimum |
| MOD | Model, modular |
| MOLD | Molded |
| MOM | Momentary |
| MOS | Metal-oxide semi-conductor |
| MOT | Motor |
| MT, MTG | Mount, mounting |
| MTL | See MET |
| MW | Milliwatt |
| MYL | Mylar |

# PARTS LIST ABBREVIATIONS

| Abbreviation | Word |
|---|---|
| NC | Normally closed |
| NI | Nickel |
| NO | Normally open |
| NP | Nonpolarized |
| NSH | Non-shorting |
| OP | Operating, operational |
| OSC | Oscillate(ing)(or) oscilloscope |
| P | Pico |
| PAP | Paper |
| PC | Printed circuit |
| PCARB | Polycarbonate |
| PF | Picofarad |
| PIV | Peak inverse voltage |
| PL | Plated |
| PNL | Panel |
| POL | Polar(ized) |
| POS | Position |
| POT | Potentiometer |
| PRI | Primary |
| PROT | Protect(or)(ion) |
| PS | Polystyrene |
| PUSHB | Pushbutton |
| PWR | Power |
| RCVG | Receiving |
| RCVR | Receiver |
| RECEP | Receptacle |
| RECT | Rectifier, rectangular |
| REG | Regulate(d)(ing)(or) |
| RES | Resist(ance)(or) |
| RF | Radio Frequency |
| RND | Round |
| ROT | Rotary |
| RT | Right |
| SB | Slow-acting, slow-blow |
| SCR | Silicon-controlled rectifier |
| SCS | Silicon-controlled switch |
| SEC | Second(ary)(s) |
| SEL | Select(ed)(or) |
| SEP | Separate |
| SH | Shorting |
| SHFT | Shaft |
| SHLD | Shield(ed)(ing) |
| SI | See SIL |
| SIG | Signal |
| SIL | Silicon |
| SPDT | Single-pole, double-throw |
| SPST | Single-pole, single-throw |
| SQ | Square |
| SUBMIN | Subminiature |
| SUP | Supply, suppressor |
| SW | Switch |
| T | Turn |
| TACH | Tachometer |
| TANT | Tanalum |
| TC | Temperature-compensat(ion)(ed) |
| TERM | Terminal(s) |
| TNL | Tunnel |
| TOG | Toggle |
| TTL | Transistor-transistor logic |
| U | Micro |
| UA | Micro ampere |
| UH | Microhenry |
| UHF | Ultra high frequency |
| UFT | Unijunction transistor |
| V | Volt(s)(age) |
| VAL | Value(s) |
| VAR | Variable |
| W | Watt |
| W/ | With |
| WO/ | Without |
| WW | Wirewound |
| XFMR | Transformer |
| XTAL | Crystal |
| XTR | Transmitter |
| ZEN | Zener |

# CHAPTER 7
# DIAGRAMS

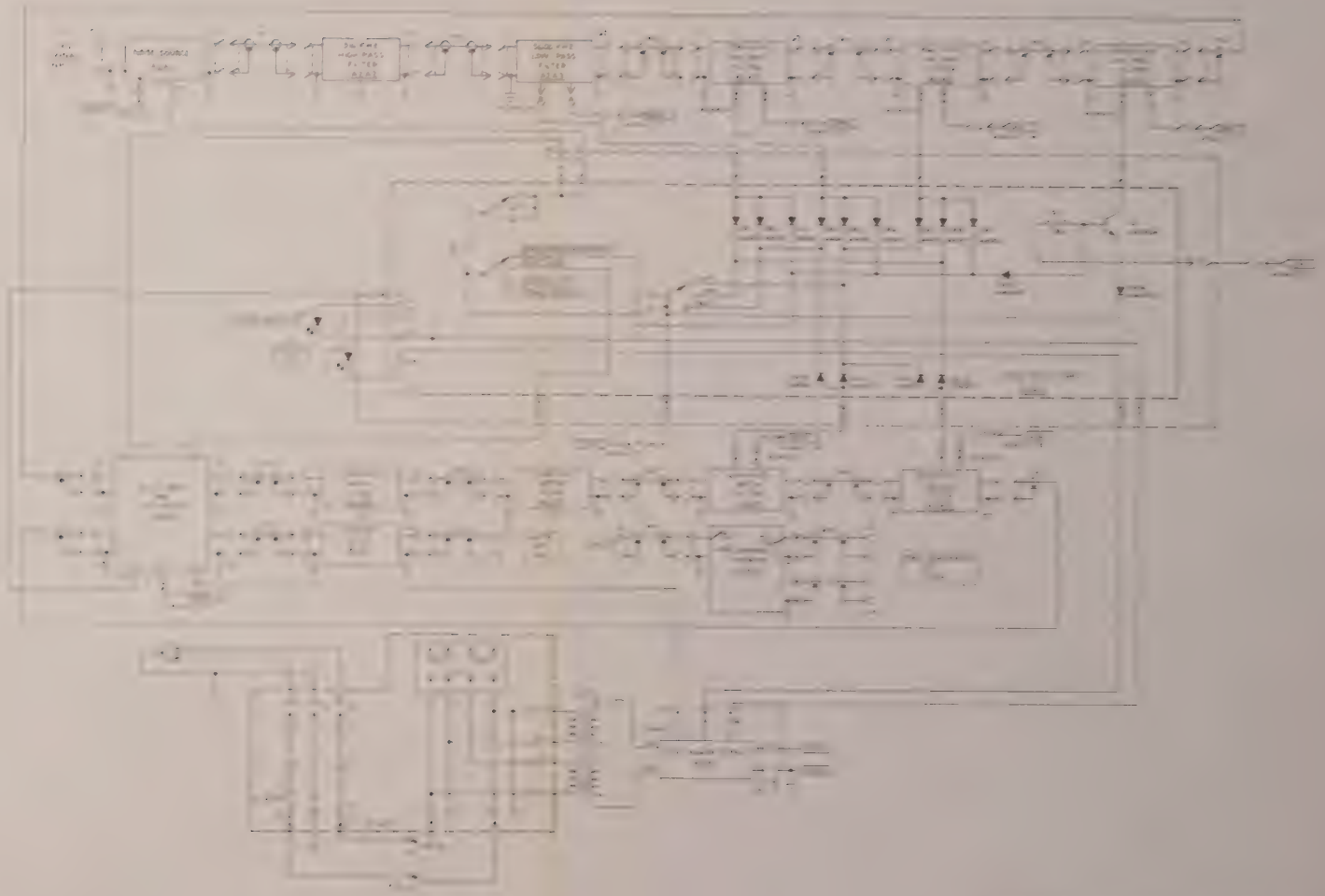


Figure 7-1. Baseband Noise Transmitter, Model 4660

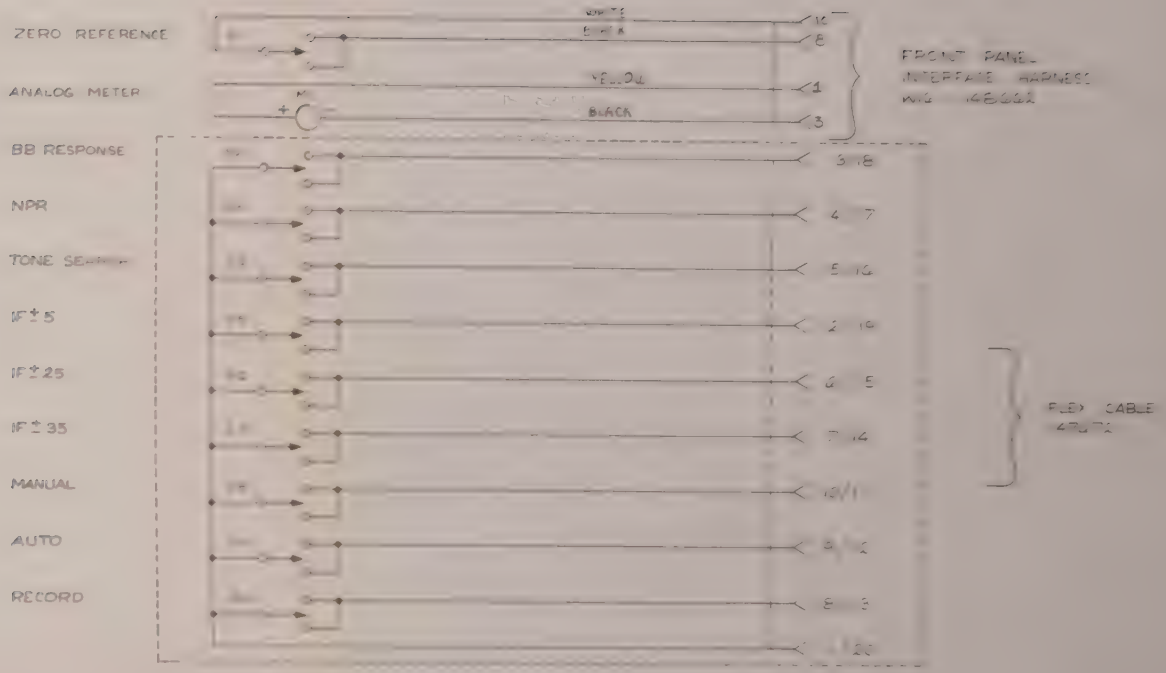
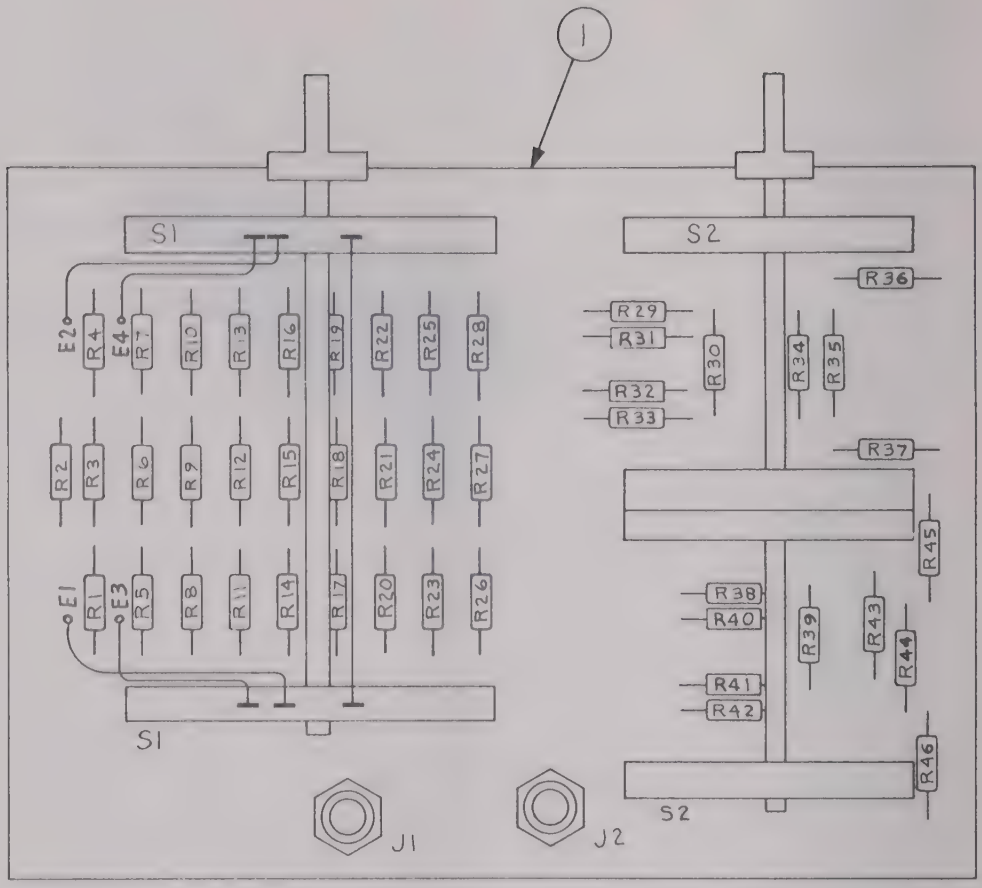
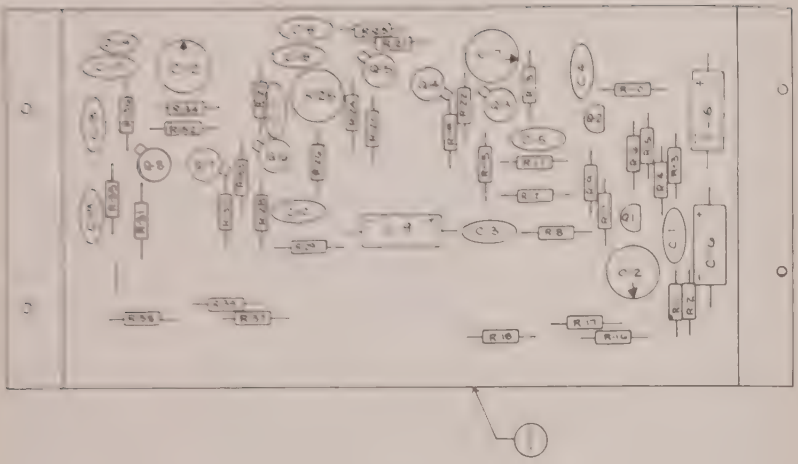
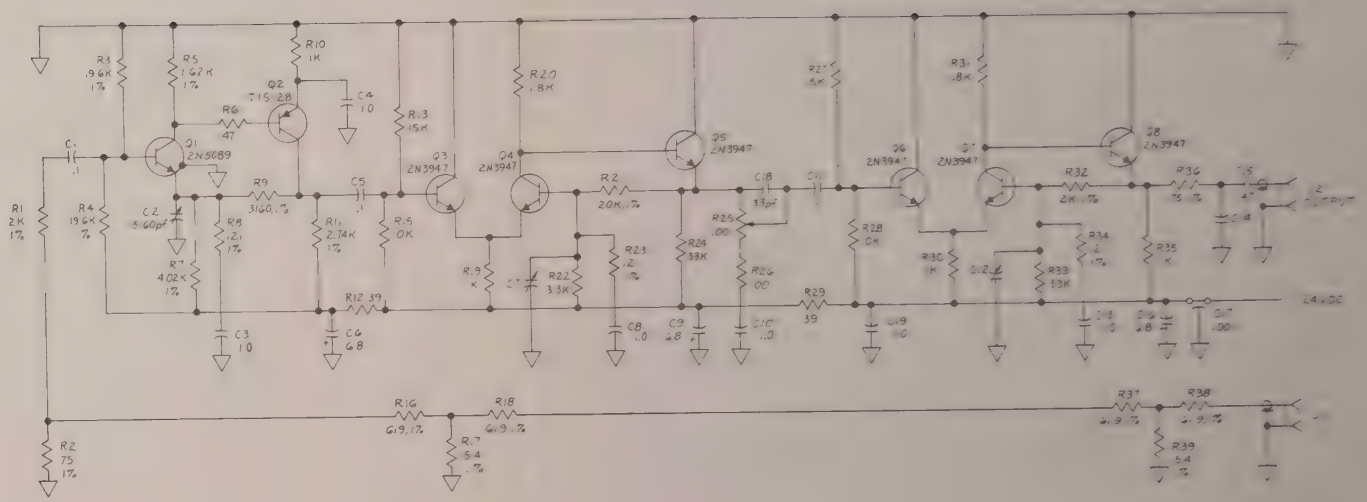



Figure 7-2. Front Panel Assembly

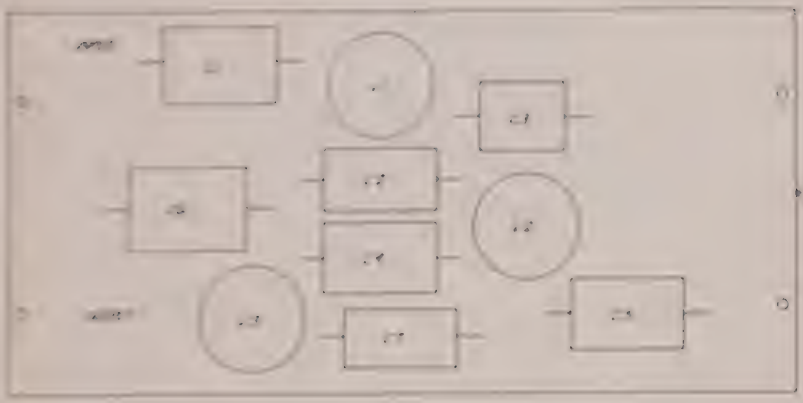

1
S1
S2
E1
E2
E3
E4
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
R20
R21
R22
R23
R24
R25
R26
R27
R28
R29
R30
R31
R32
R33
R34
R35
R36
R37
R38
R39
R40
R41
R42
R43
R44
R45
R46
S1
S2
J1
J2


C 1
C 2
C 3
C 4
C 5
C 6
C 7
C 8
C 9
C 10
C 11
C 12
C 13
C 14
C 15
C 16
C 17
C 18
C 19
C 20
C




NOTE: C7, C12, C14 FACTORY SELECT.
C17 LOCATED ON NOISE SOURCE CHASSIS.

Figure 7-5. Noise Source



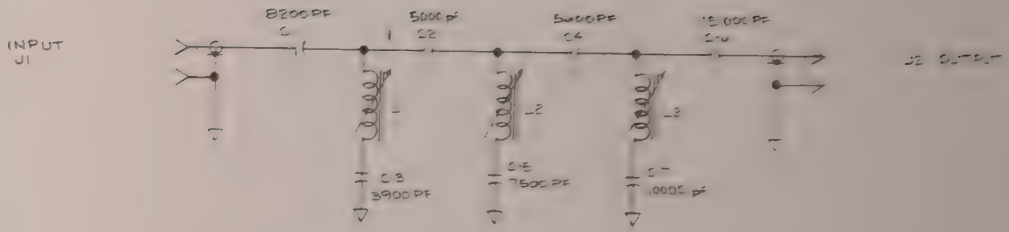
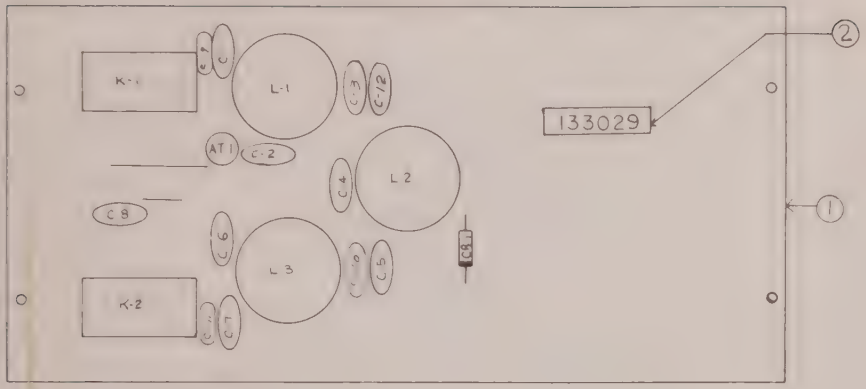



Figure 7-6. Filter Assembly - High Pass 316 kHz


K-1
C-1
C
L-1
C-3
C-12
AT 1
C-2
C 4
L 2
C 8
C 6
L 3
C 9
C 5
C 8
K-2
C-11
C 7
133029
2
1

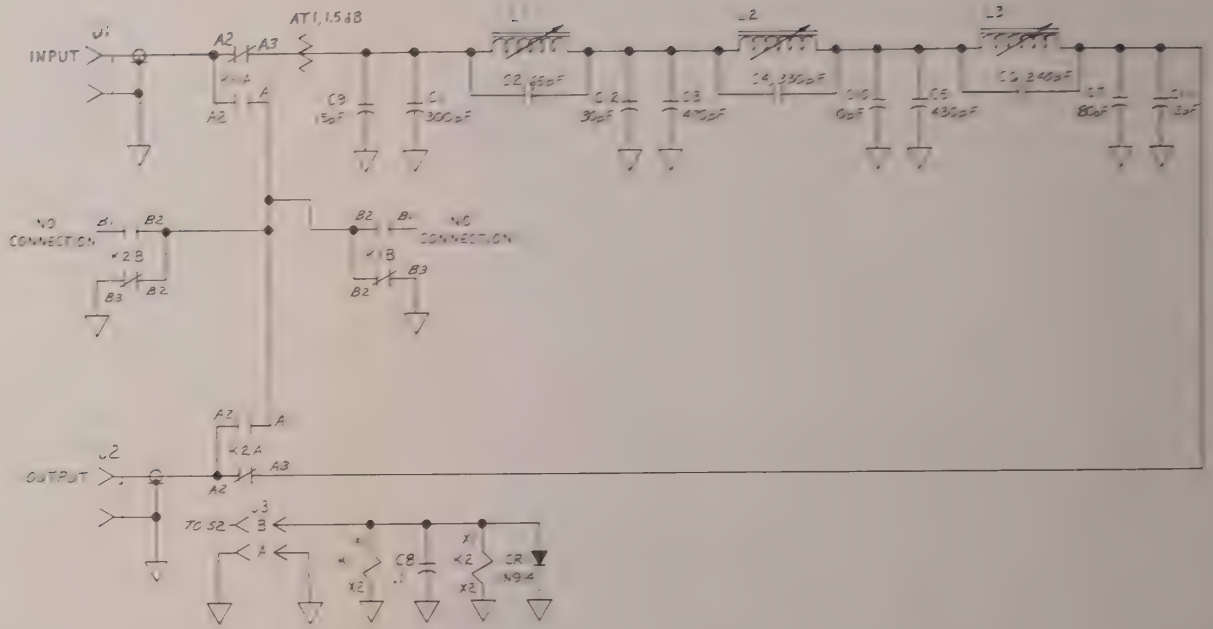
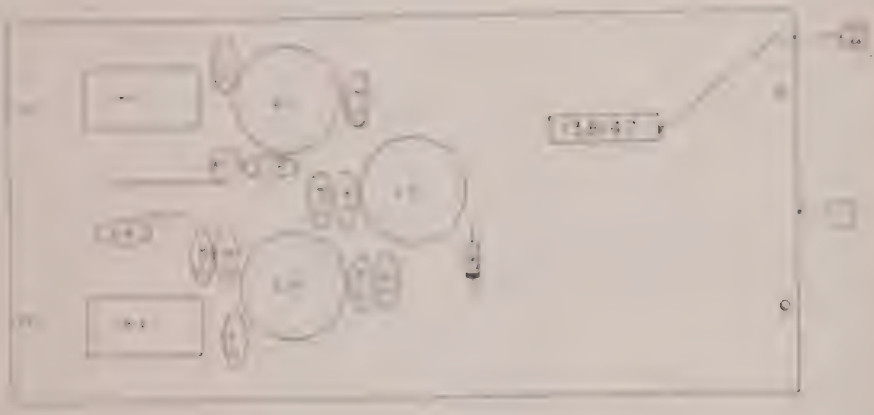
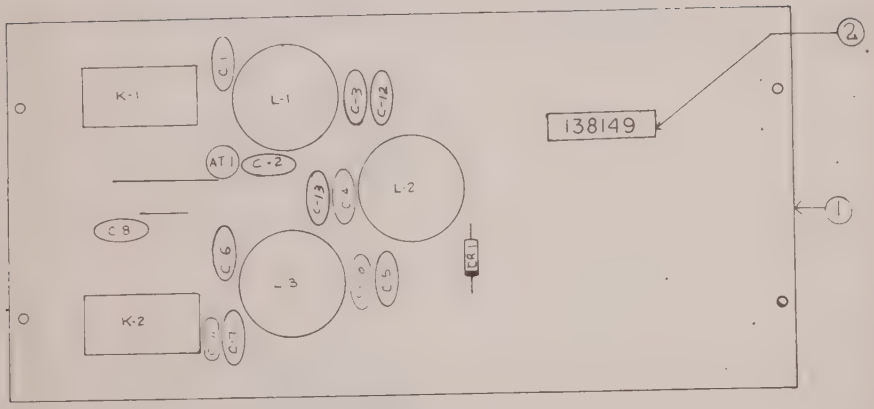



Figure 7-7. Filter Assembly - Low Pass 5600 kHz




K-1
C-1
L-1
C-3
C-12
138149
2
AT 1
C-2
C-13
C-4
L-2
1
C 8
C 6
L 3
C 5
CR1
K-2
C-7

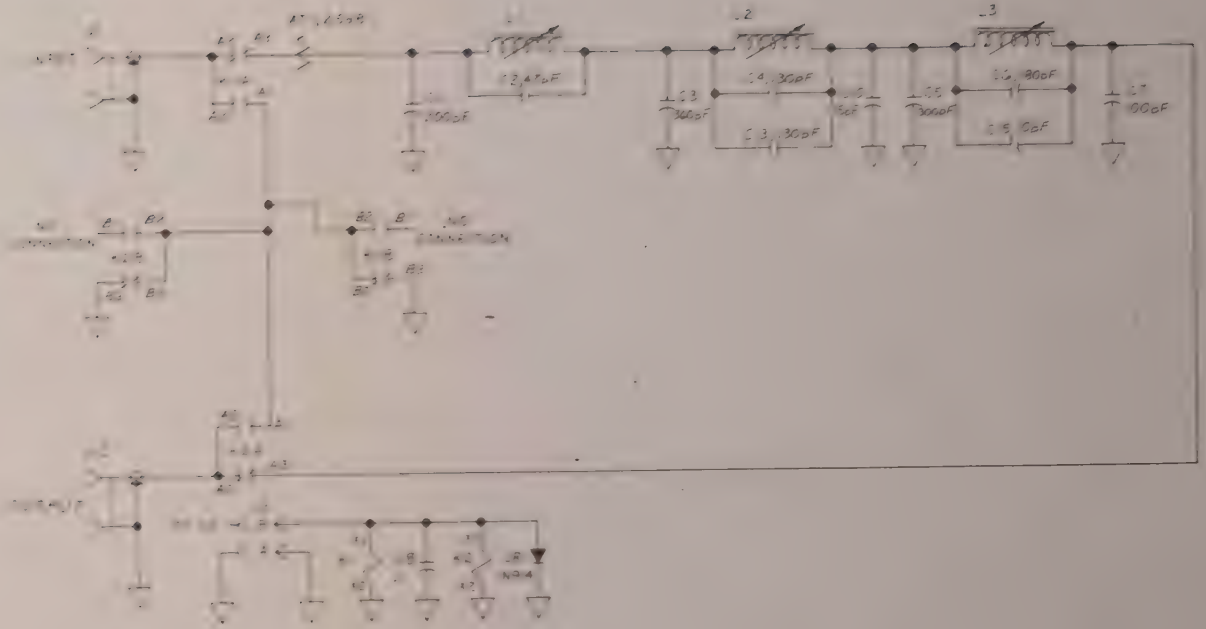
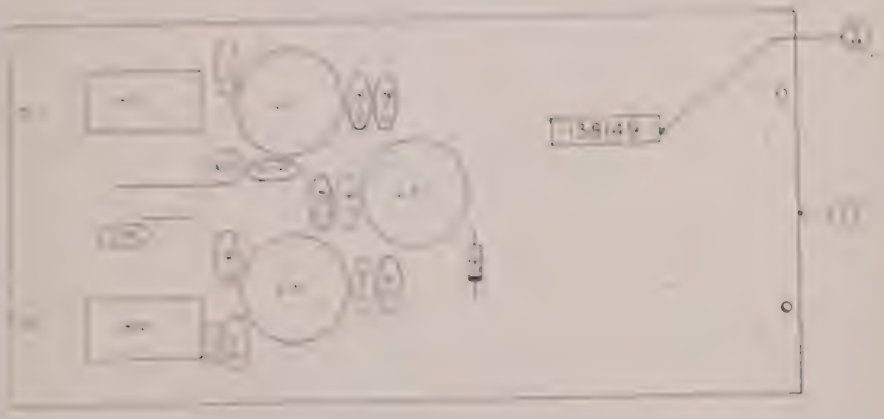



Figure 7-8. Filter Assembly - Low Pass 7284 kHz



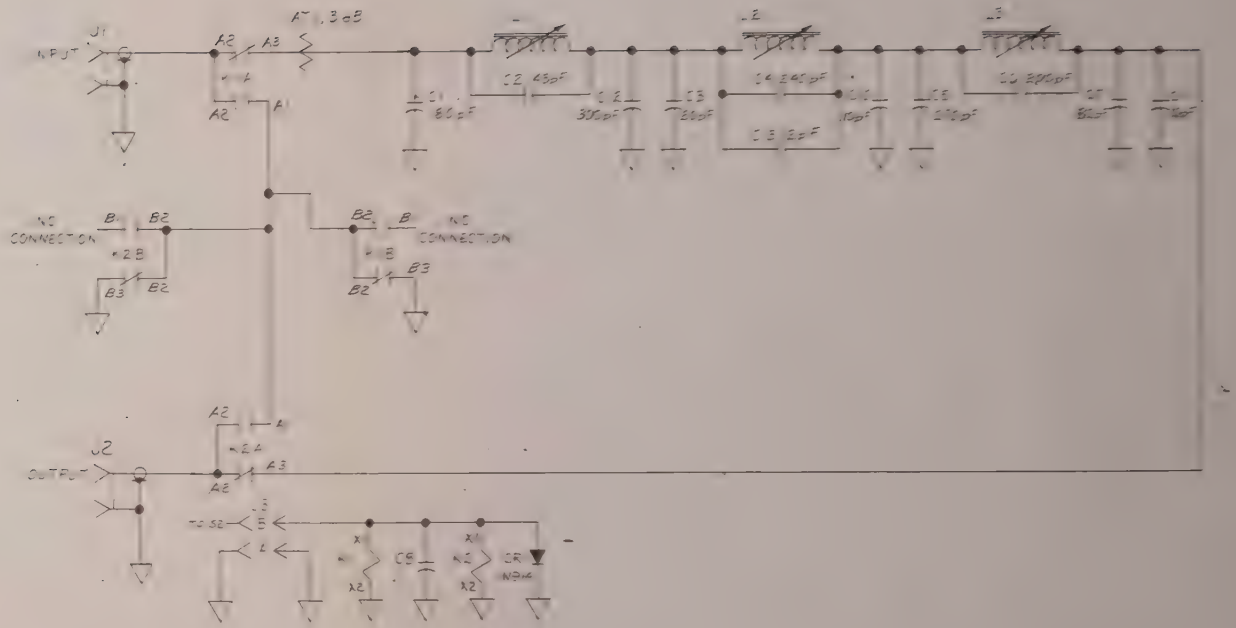
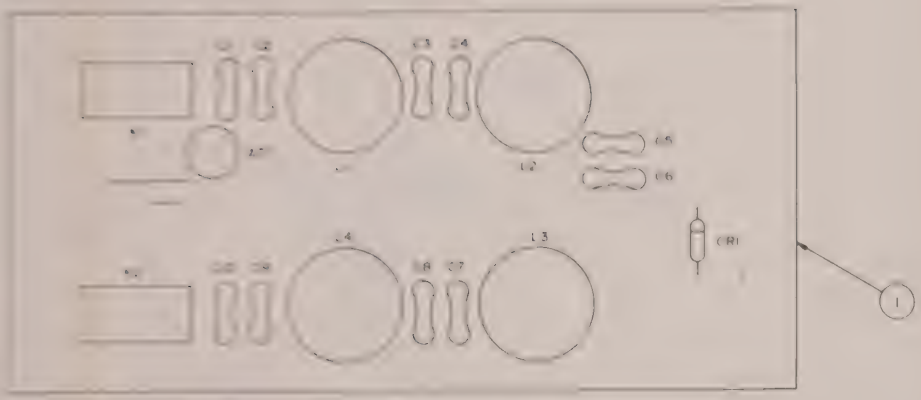



Figure 7-8 Filter Assembly - Low Pass FI6F kHz


L4
L3
CR1
1

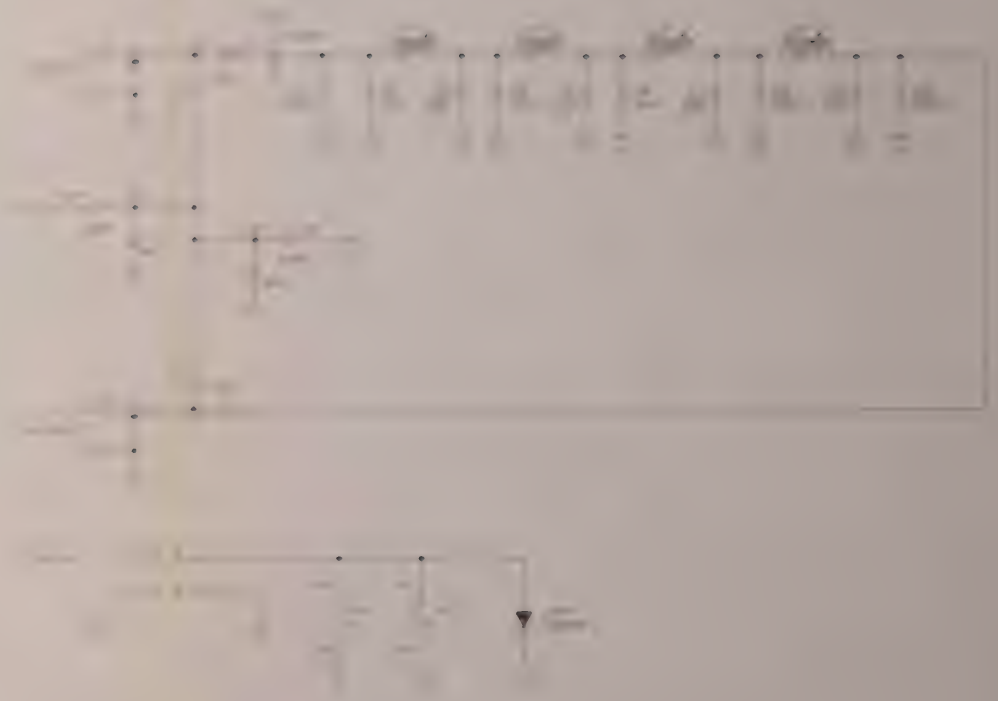
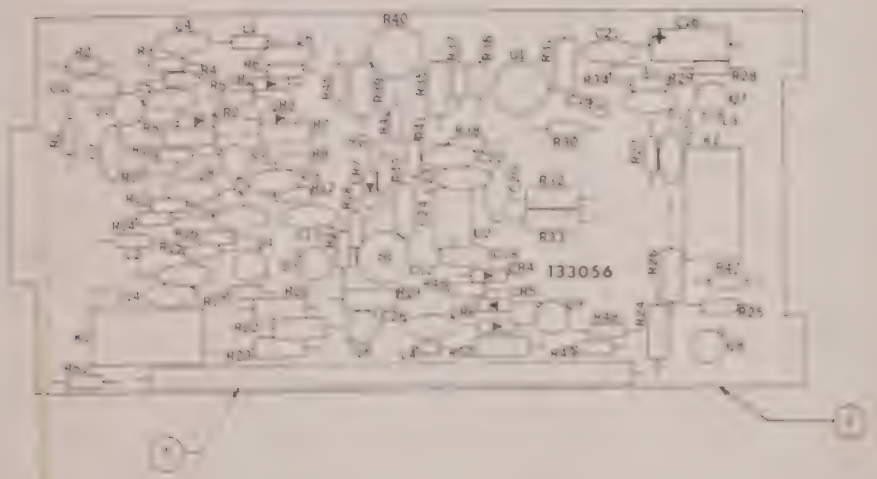


Figure 2-10. Filter Assembly, Low Pass 10 MHz


R40
133056
R33
R30
R25

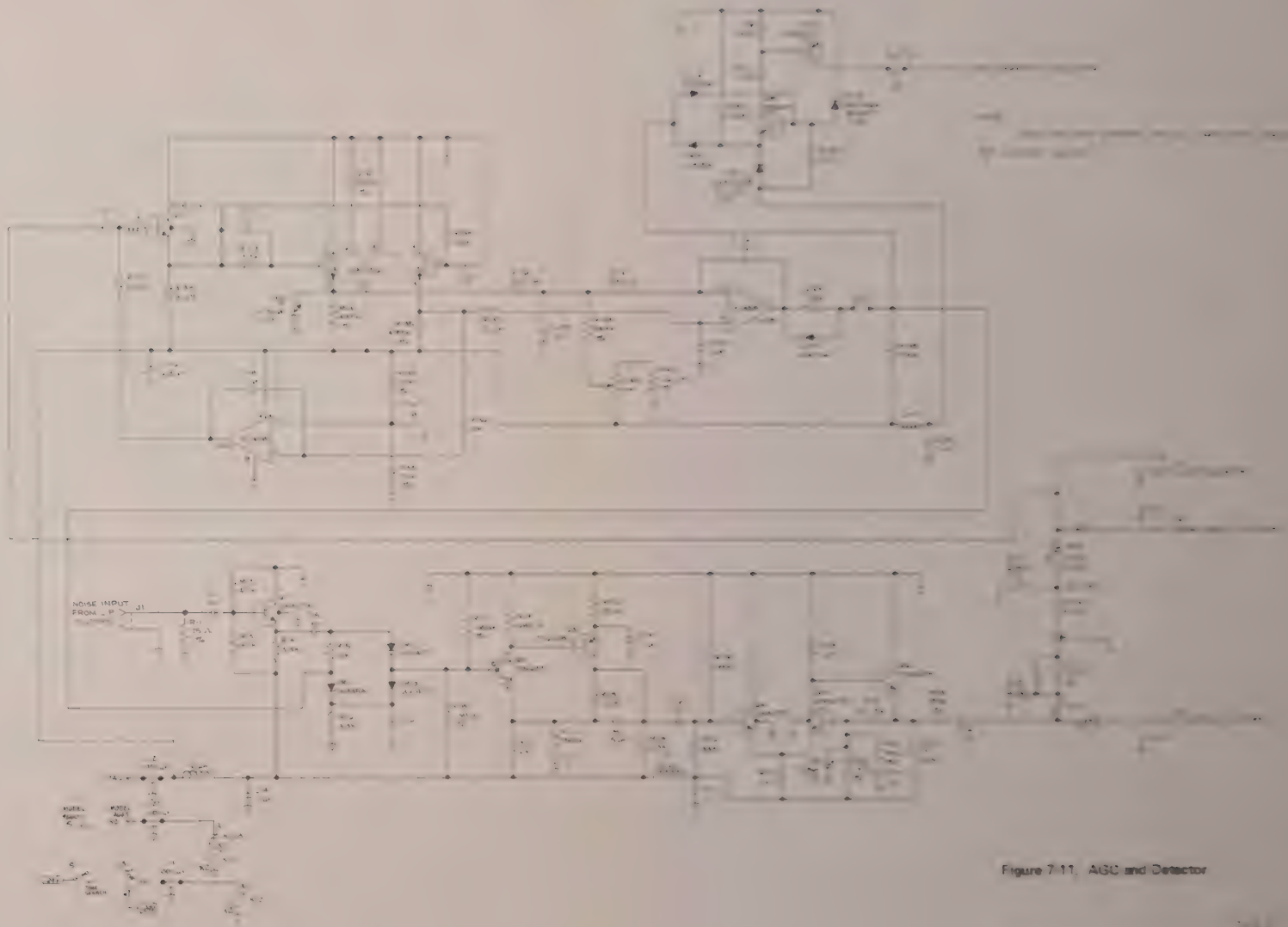
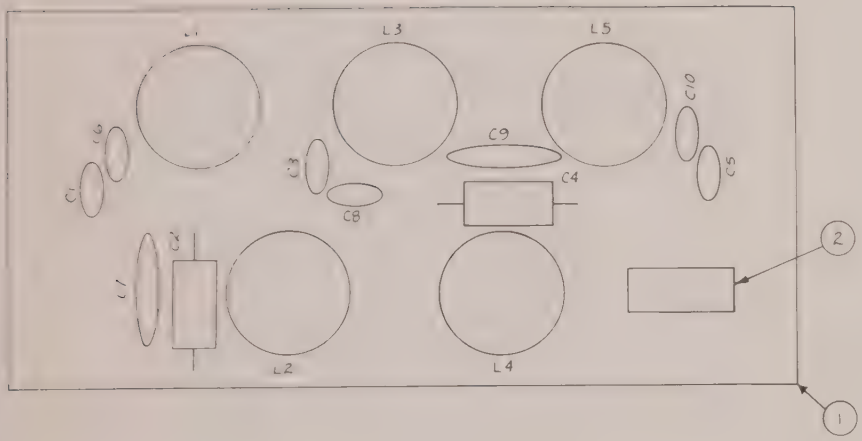



Figure 7-11. AGC and Detector


L1
L3
L5
C10
C9
C6
C7
C3
C4
C5
C8
C1
L2
L4
2
1

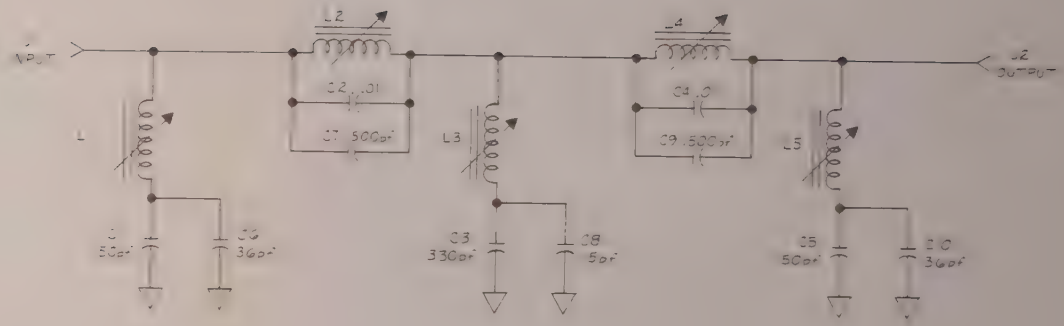
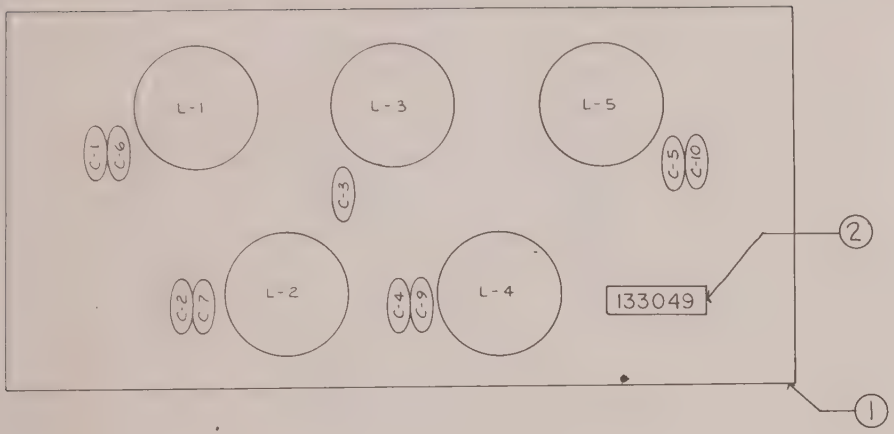



Figure 7-12. Notch Filter Assembly - 1248 kHz


L-1
L-3
L-5
C-1
C-6
C-3
C-5
C-10
L-2
L-4
C-2
C-7
C-4
C-9
133049
2
1

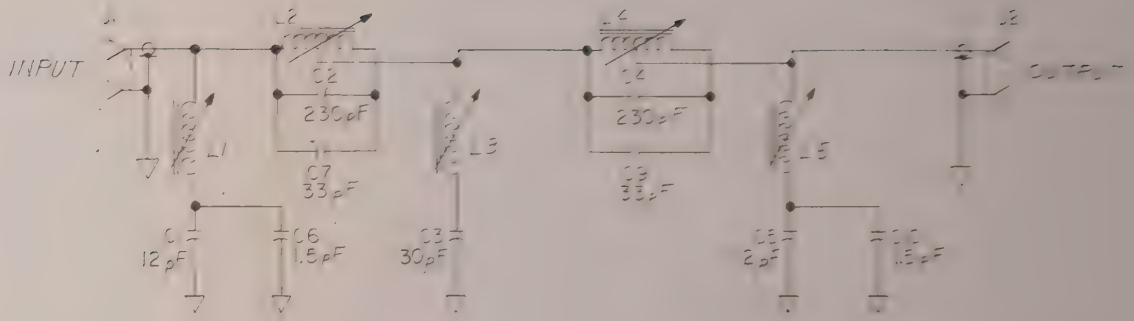



Figure 7-13. Notch Filter Assembly - 5340 kHz

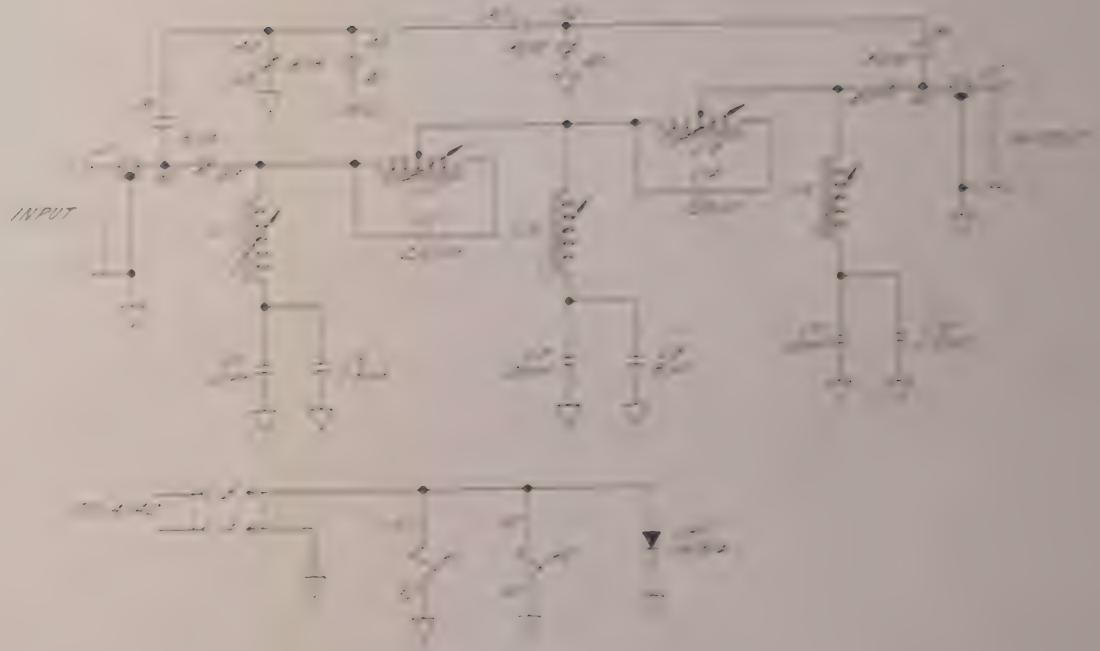



Figure 7-14. Notch Filter Assembly, 2800 kHz

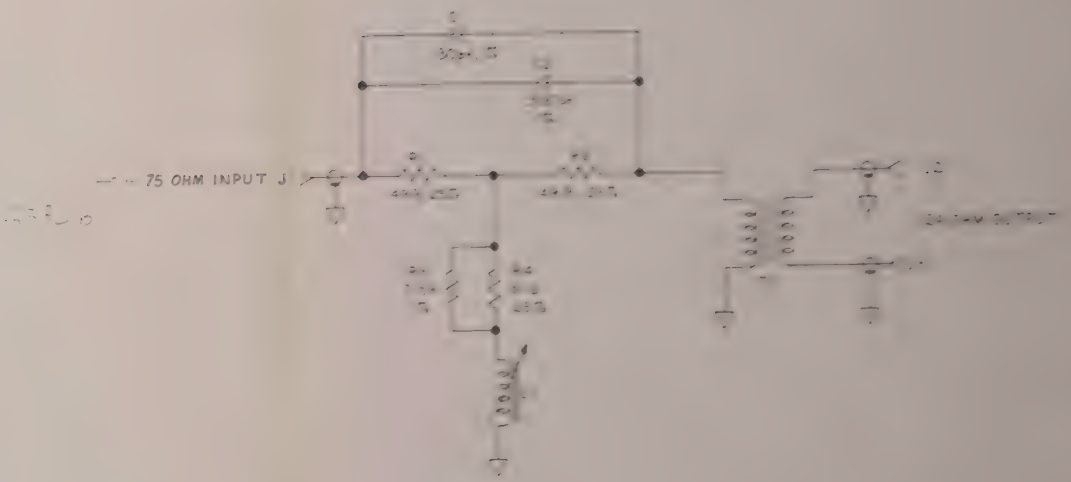



Figure 7-16. Pre-Emphasis Network

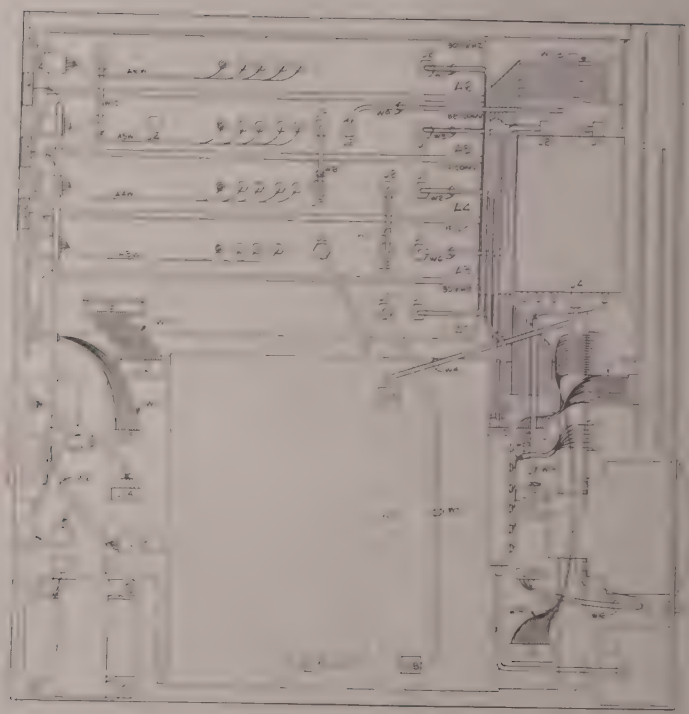
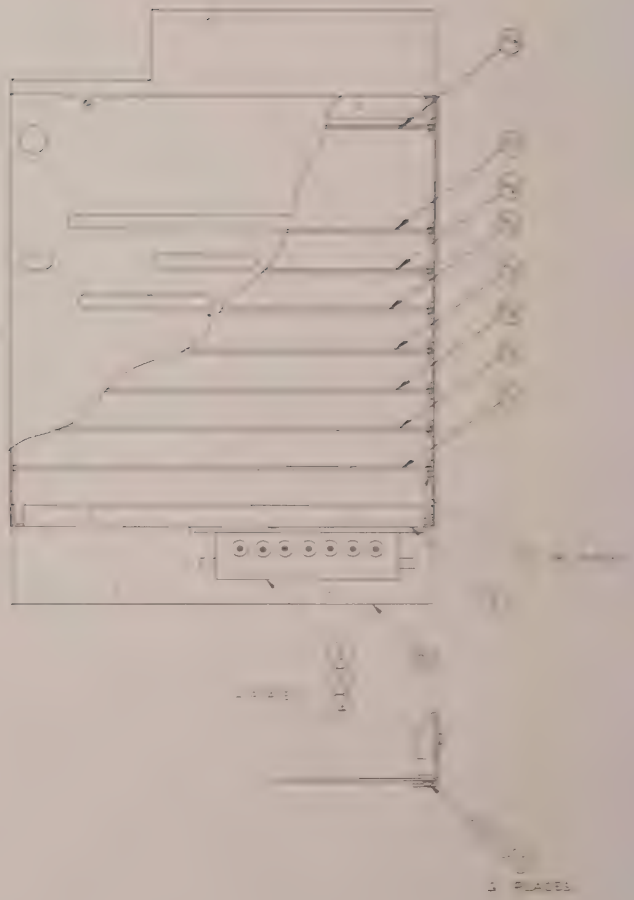


Figure 7-18. Model 4670 IF/Baseband Analyzer



| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

TO BE SUPPLIED

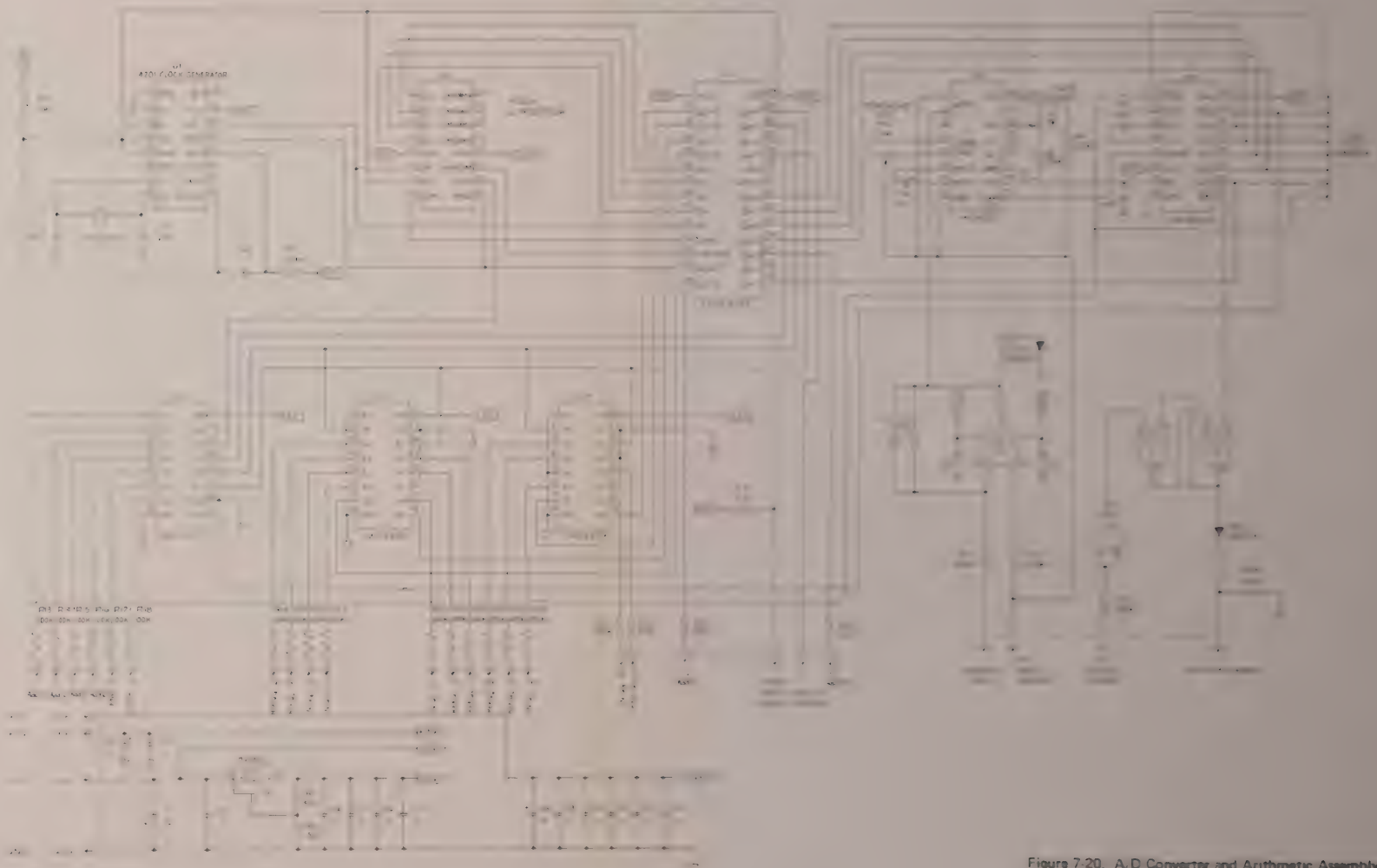
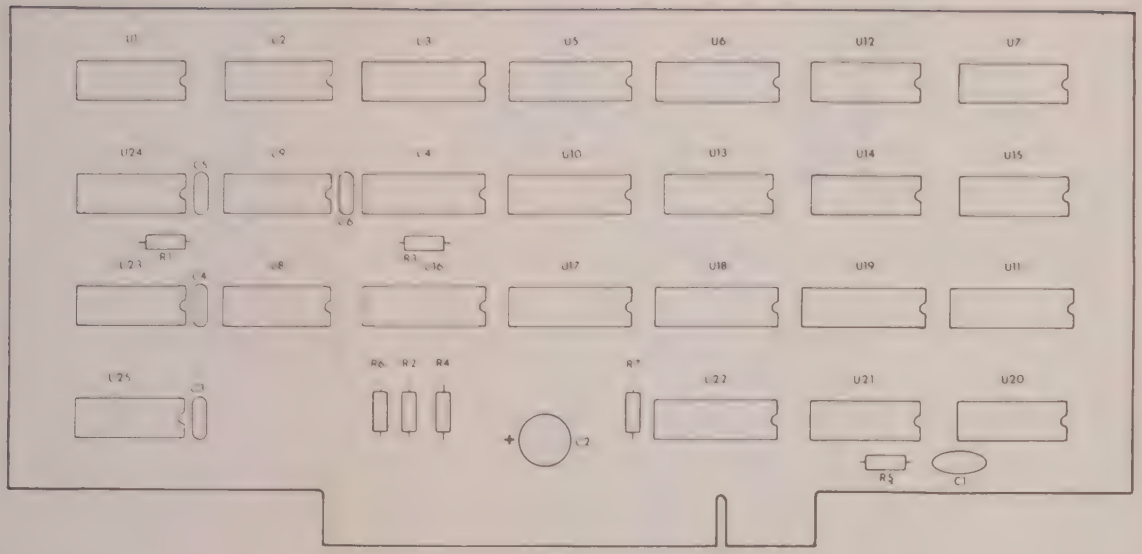


Figure 7-20. A/D Converter and Arithmetic Assembly


U1
U2
U3
U5
U6
U12
U7
U24
U9
U4
U10
U13
U14
U15
R1
R3
U23
U8
U16
U17
U18
U19
U11
R6
R2
R4
R7
U25
U22
U21
U20
R5
C1
C2

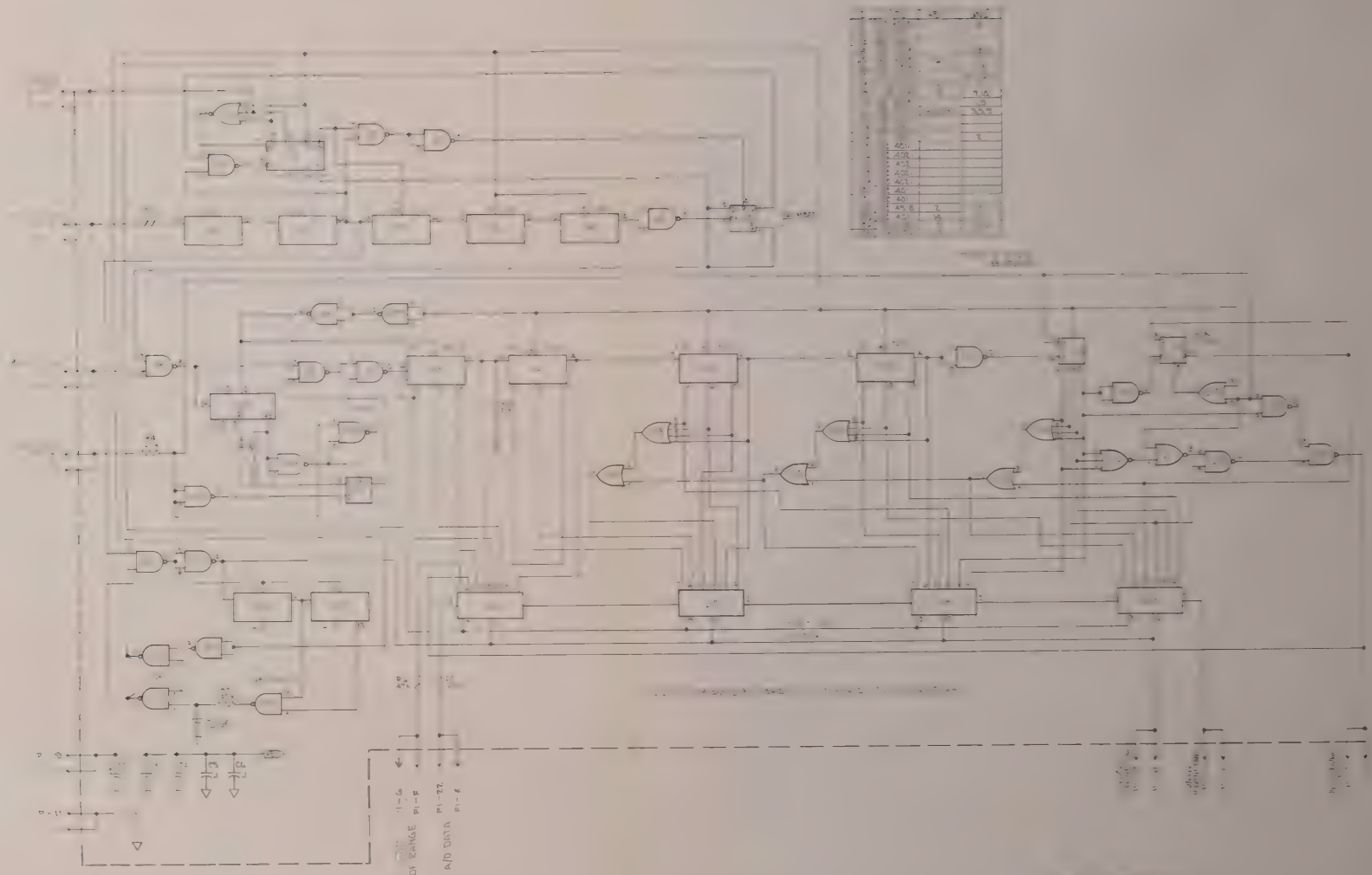
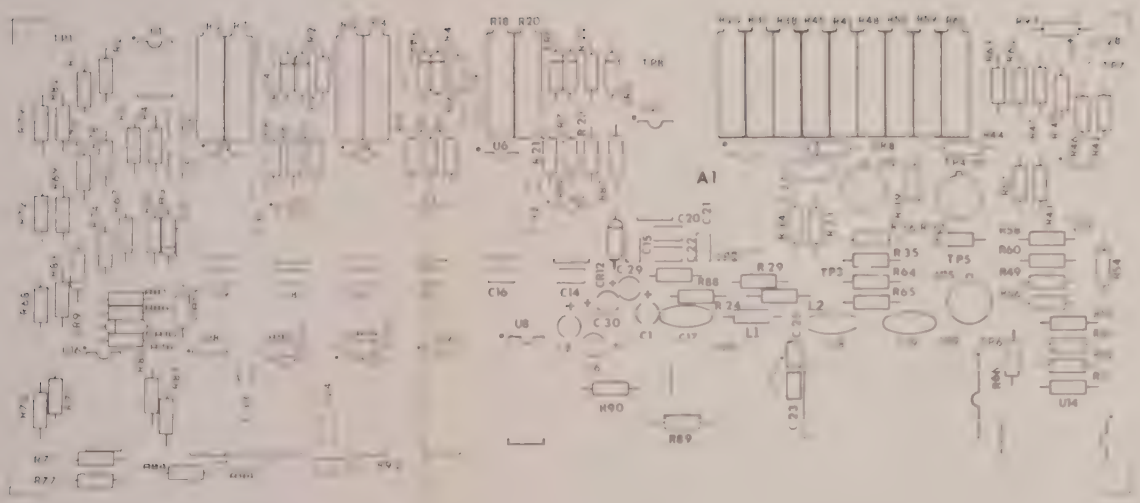



Figure 7-21. Counter


A1
R18 R20
TP8
U6
C20
C21
C22
C15
C16
C14
CR12
C29
R88
R29
R24
C30
C1
C17
L1
L2
C28
C23
U8
R90
R89
TP3
TP5
R35
R64
R65
R60
R49
U14

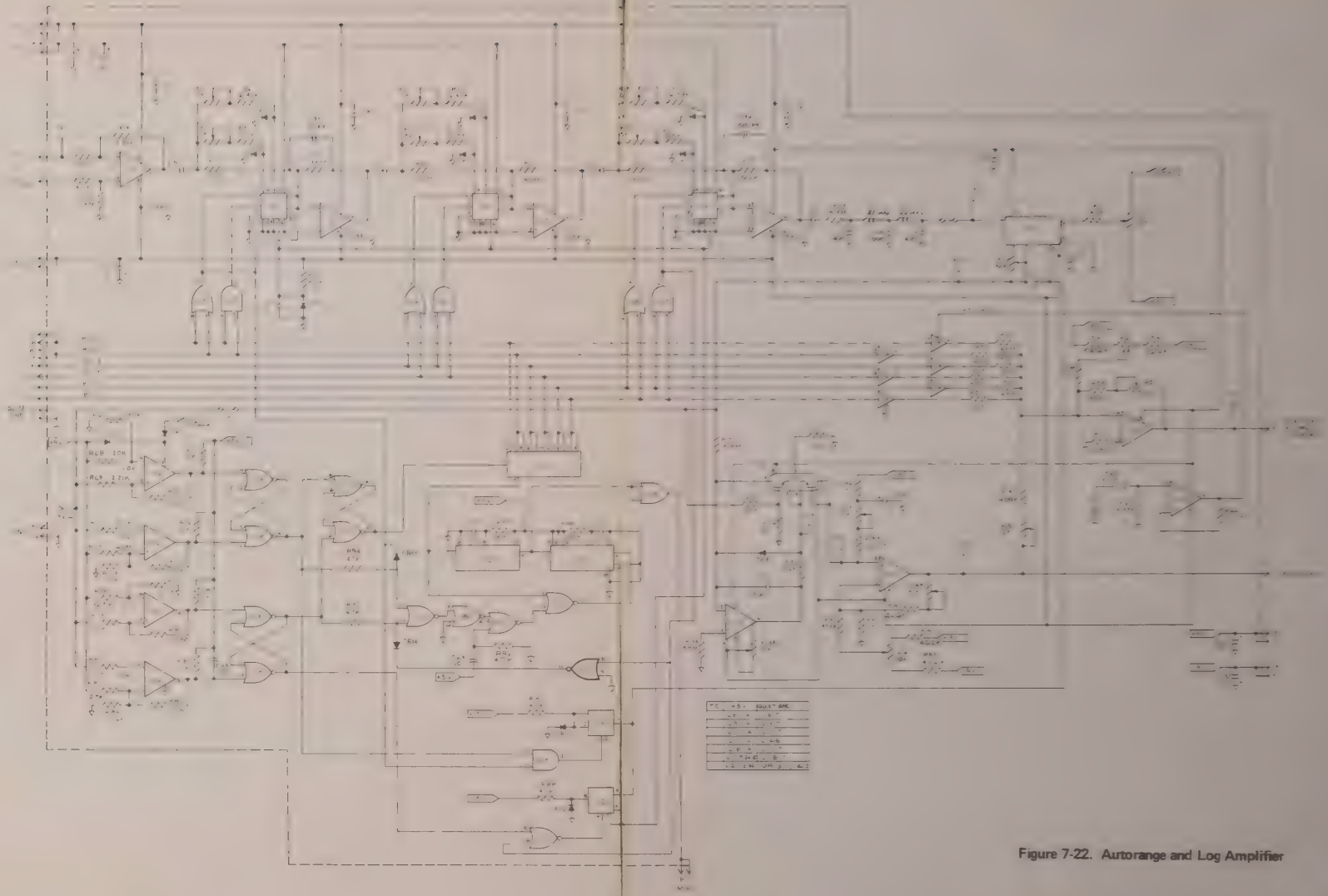
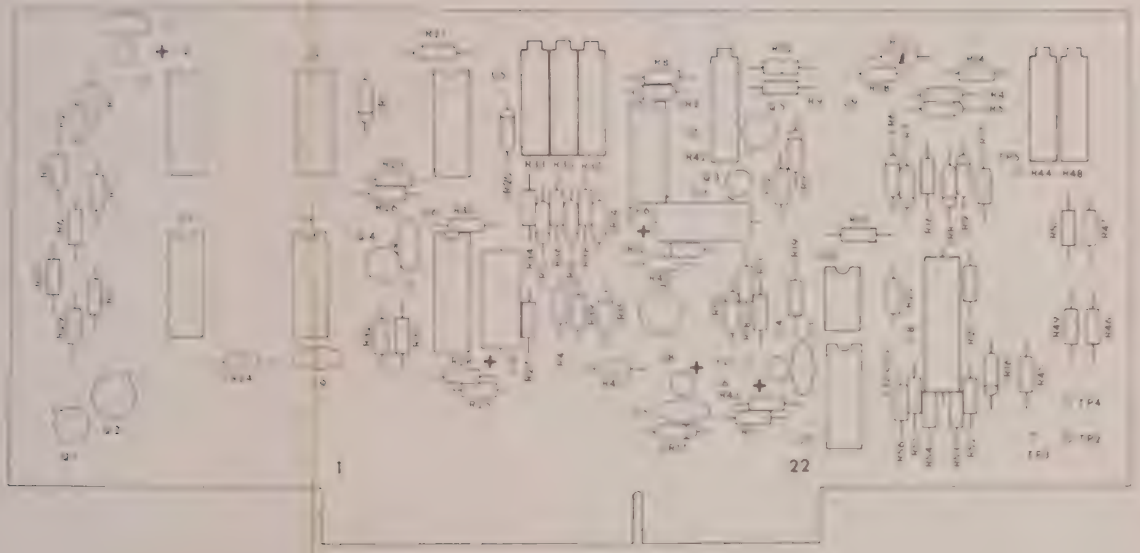


Figure 7-22. Autorange and Log Amplifier


1
22

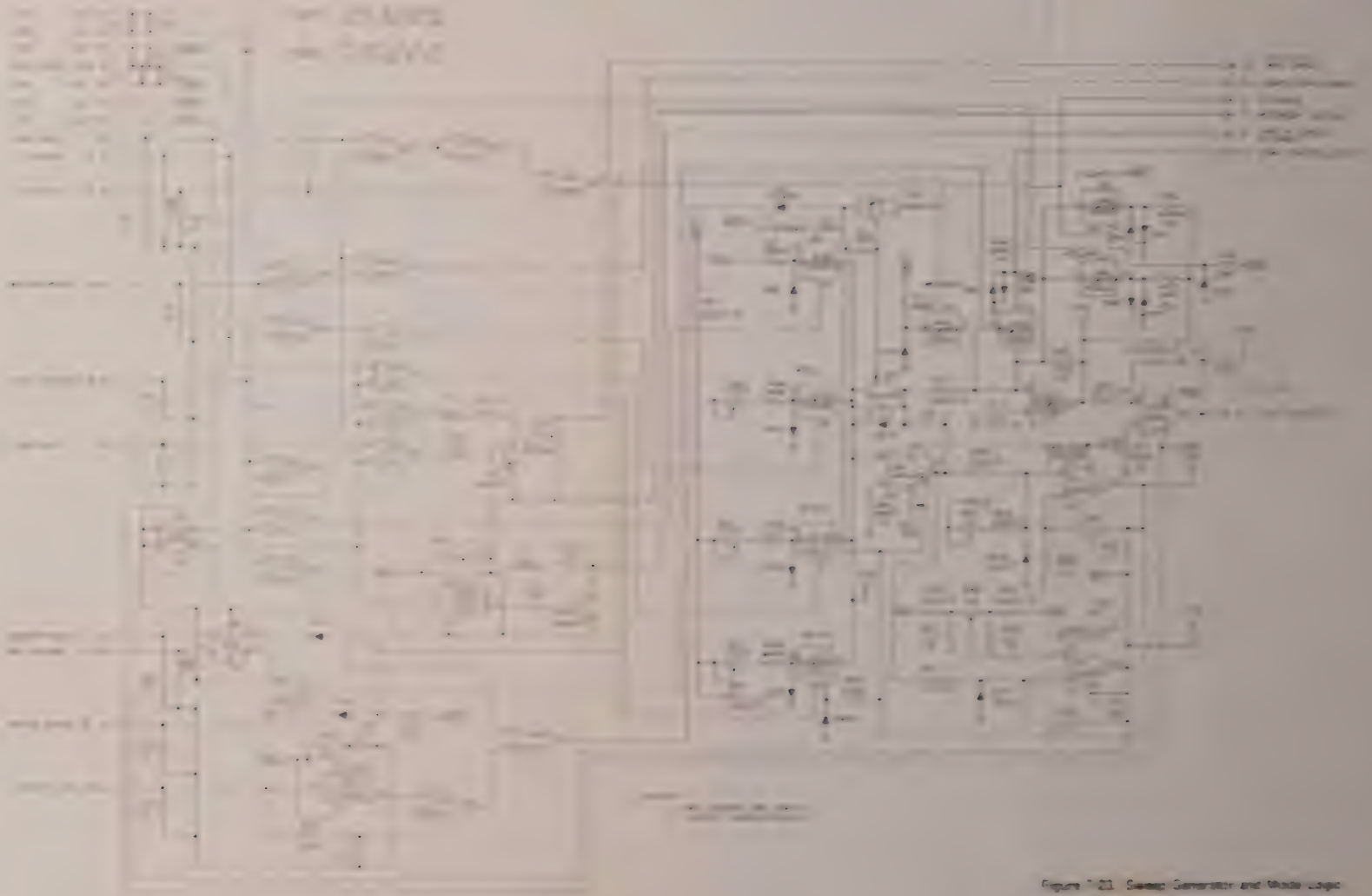


Figure 7-23. Sweep Generator and Mode Logic

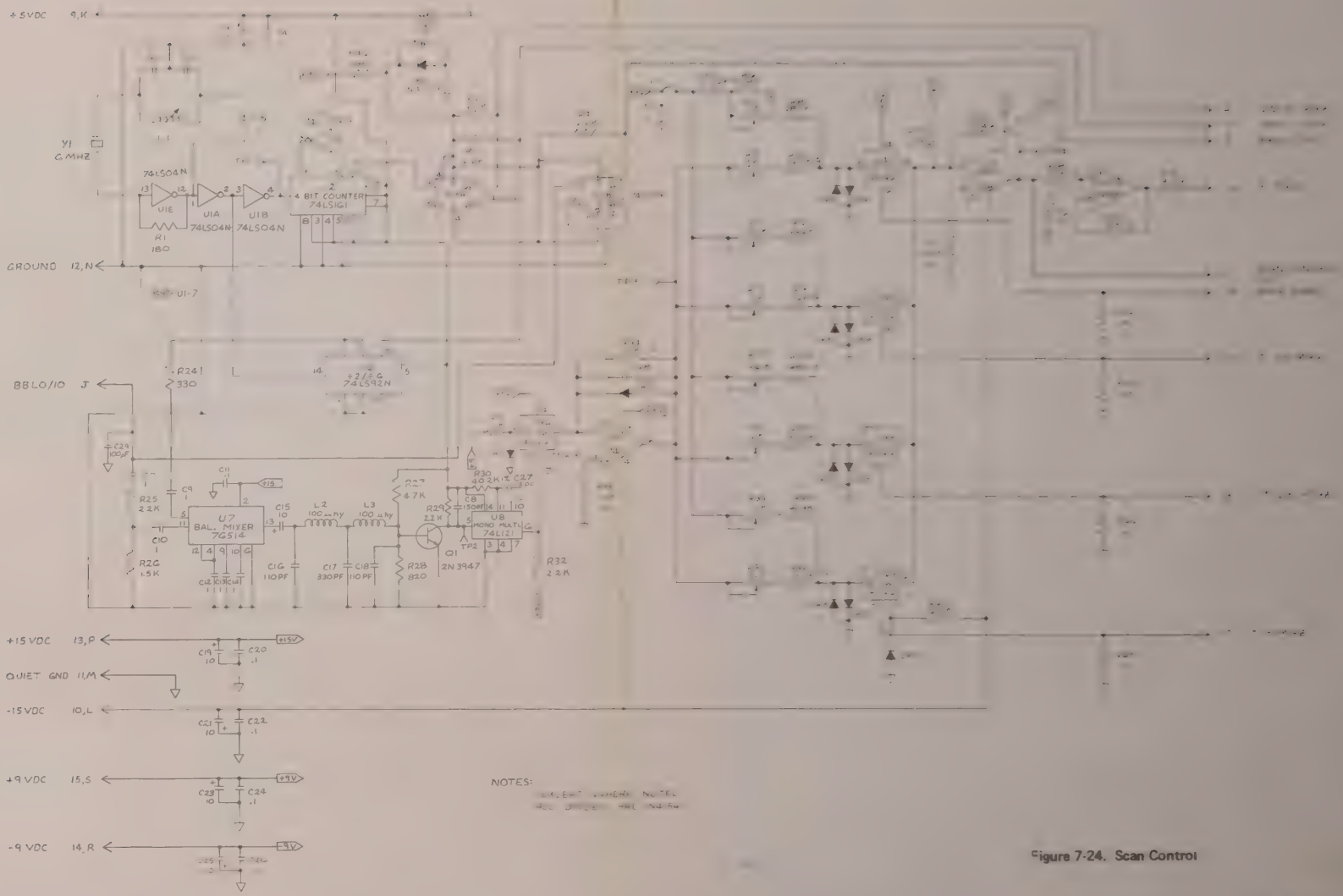
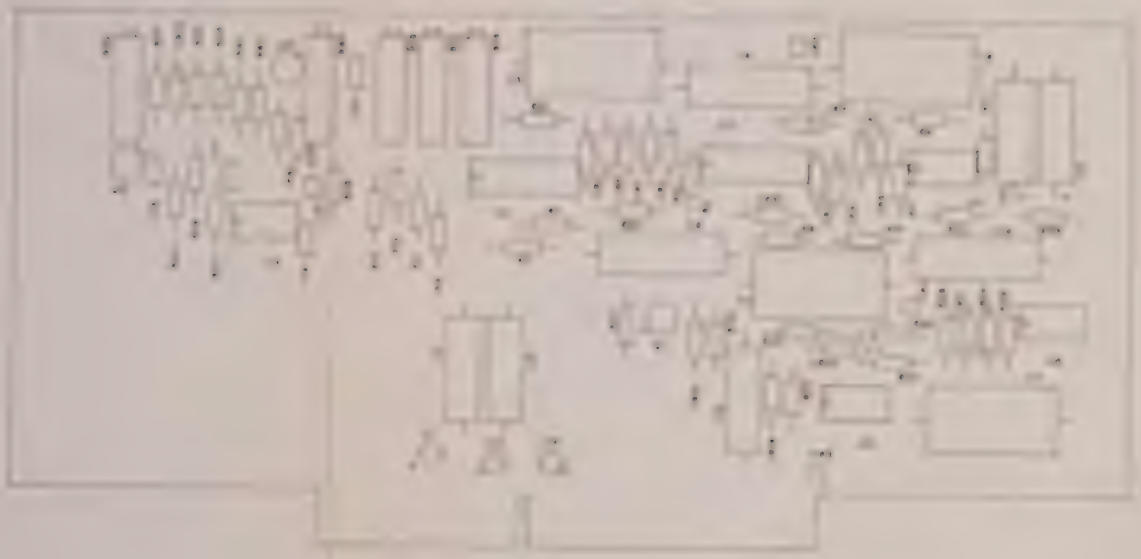
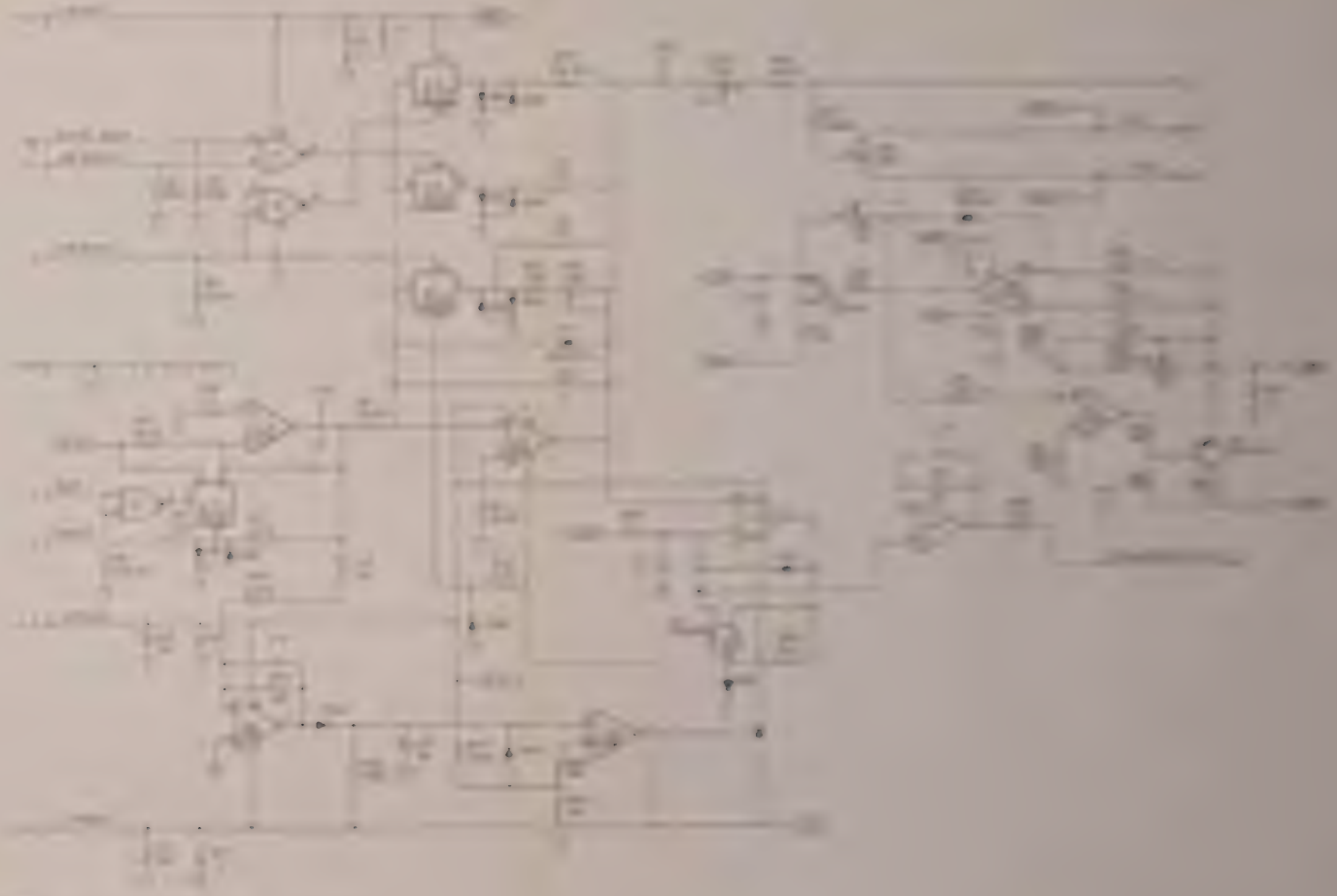
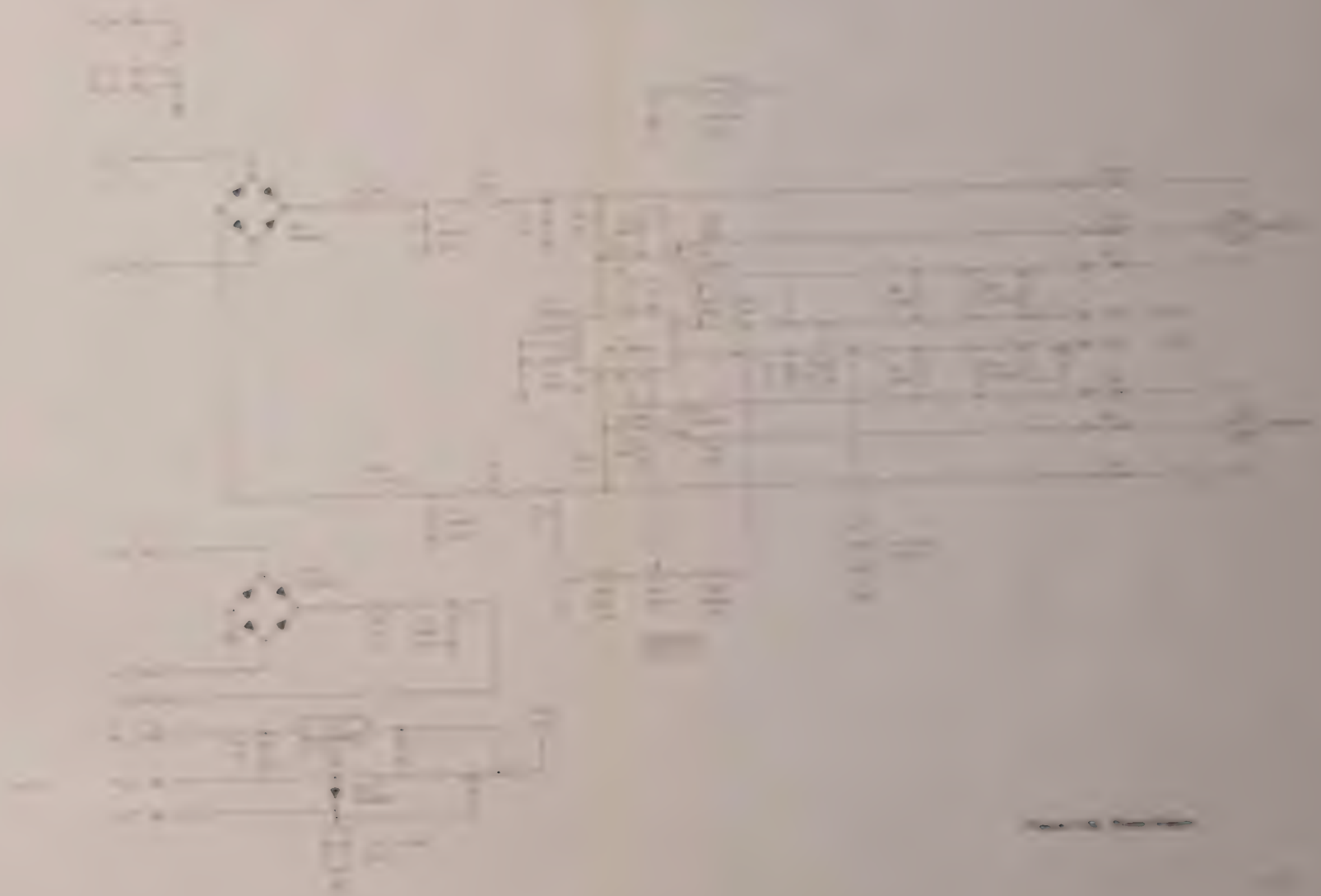
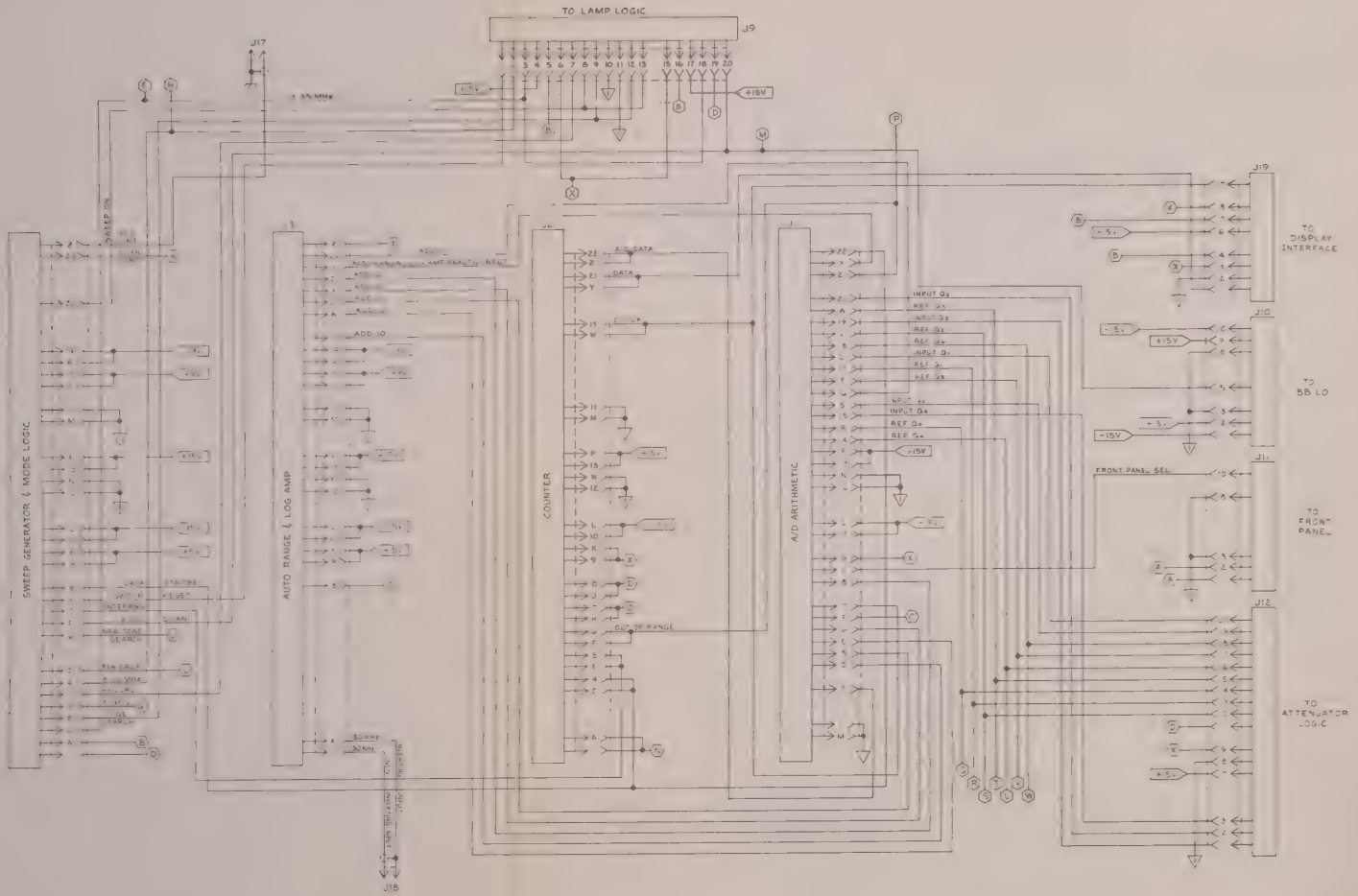



Figure 7-24. Scan Control








TO LAMP LOGIC
J9
J17
J19
J10
J11
J12
J18
SWEEP GENERATOR & MODE LOGIC
AUTO RANGE & LOG AMP
COUNTER
A/D ARITHMETIC
TO DISPLAY INTERFACE
TO BB LO
TO FRONT PANEL
TO ATTENUATOR LOGIC
FRONT PANEL SEL
+18V
+15V
-15V
+5V
-5V
INPUT Q3
INPUT Q4
REF Q3
REF Q4

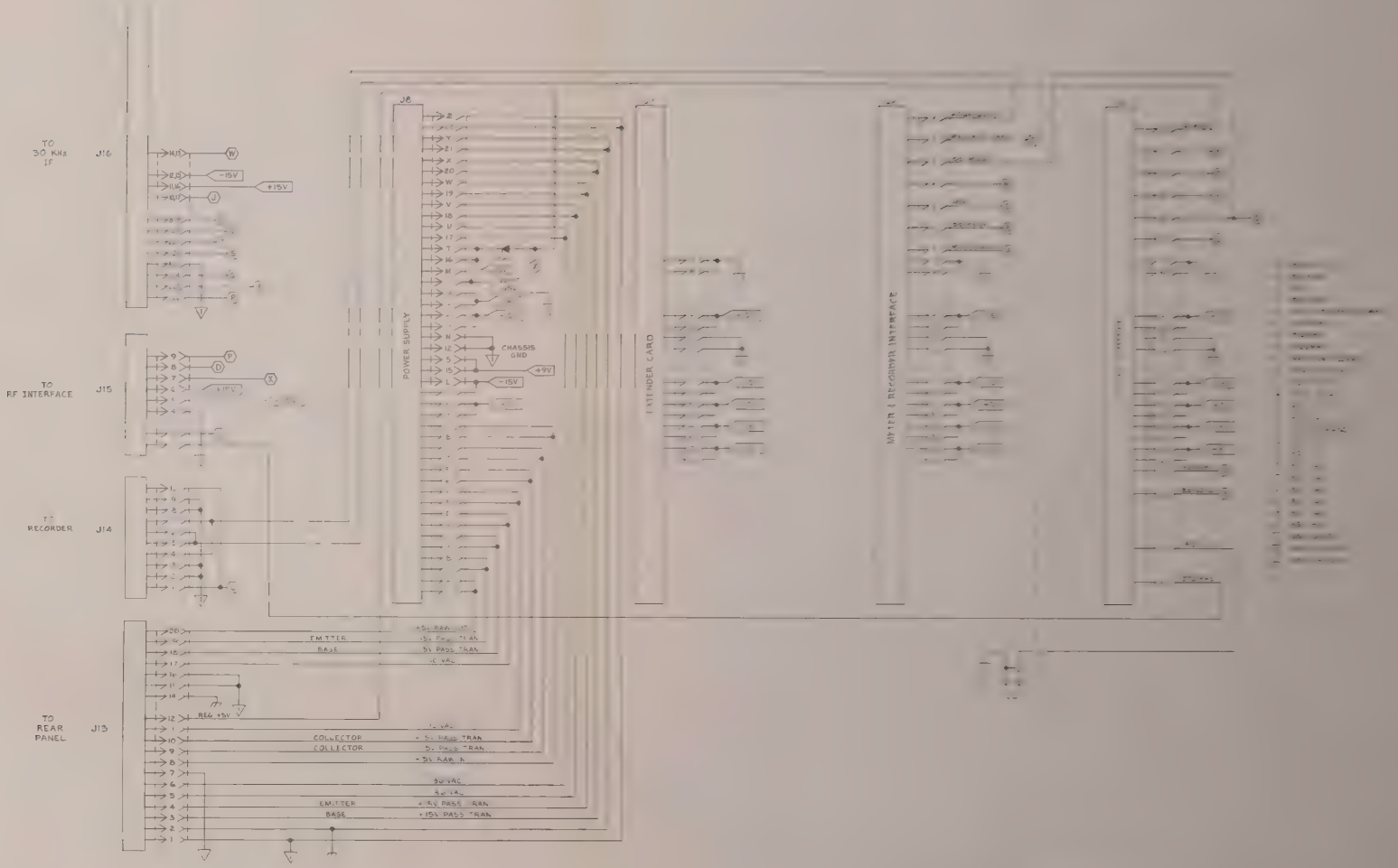
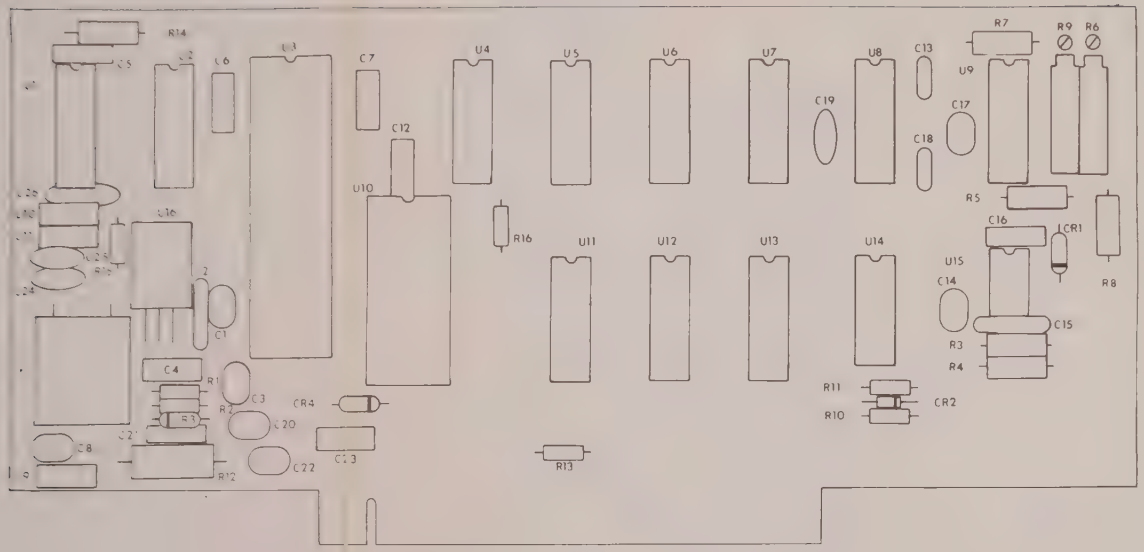
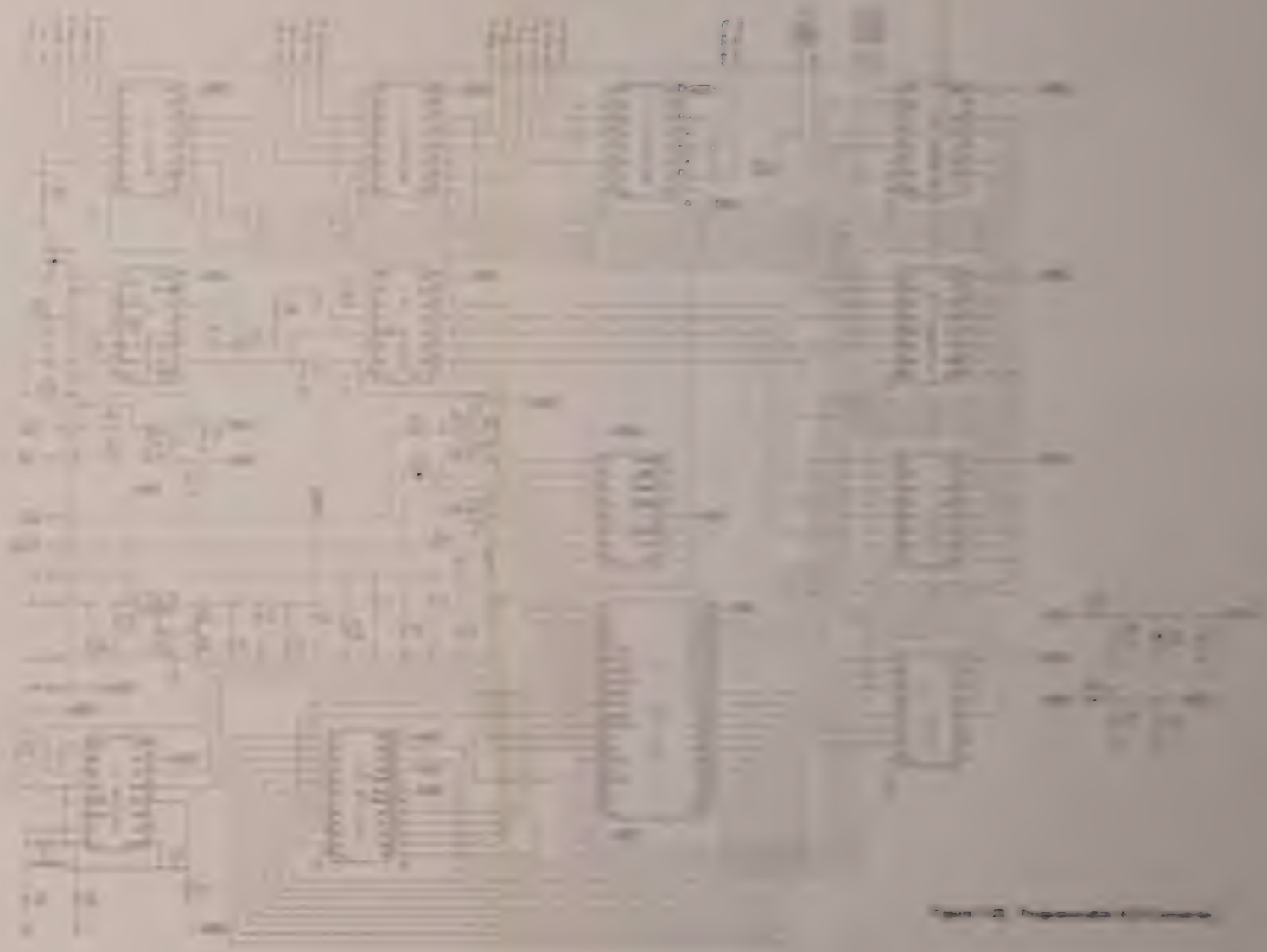
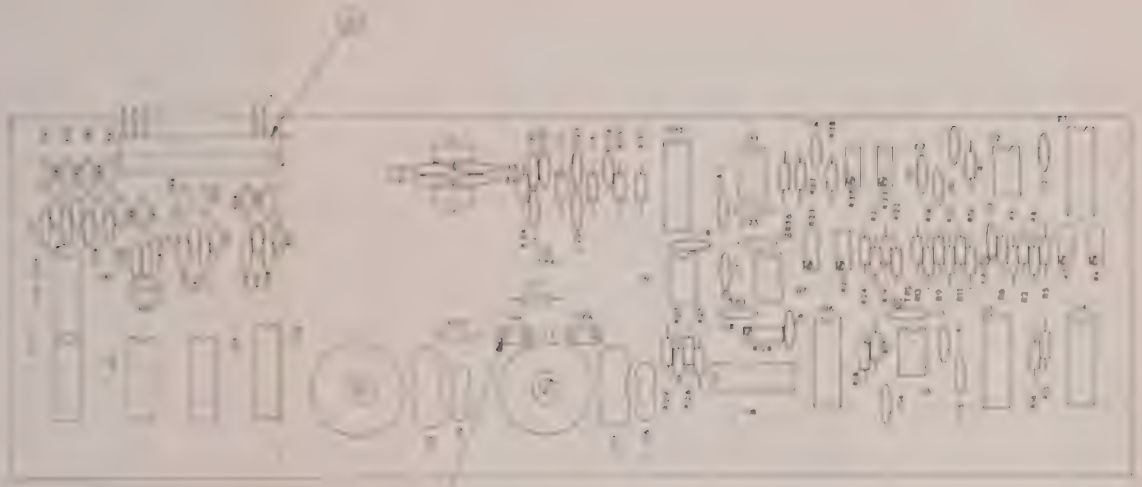


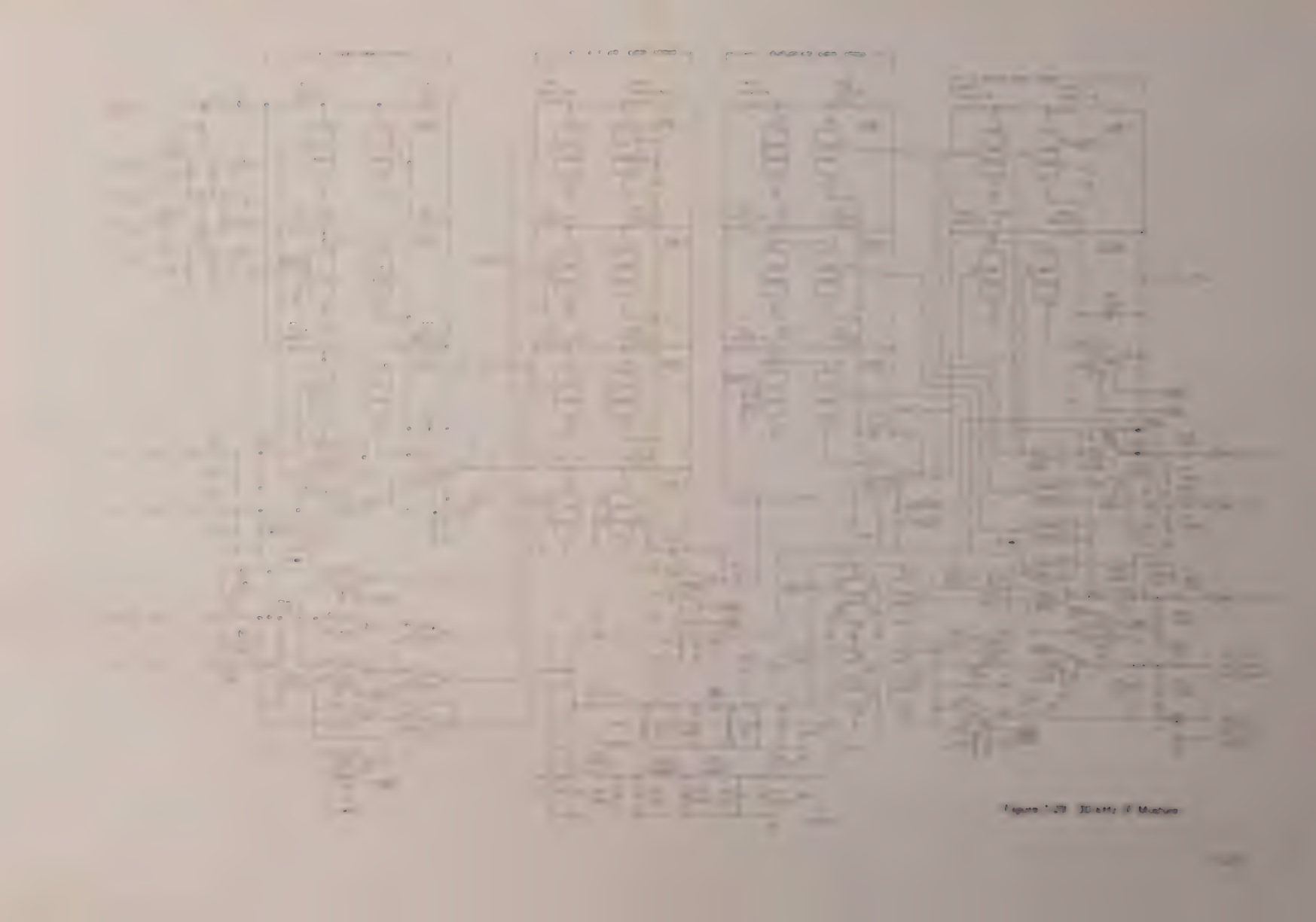

Figure 7-27. Motherboard

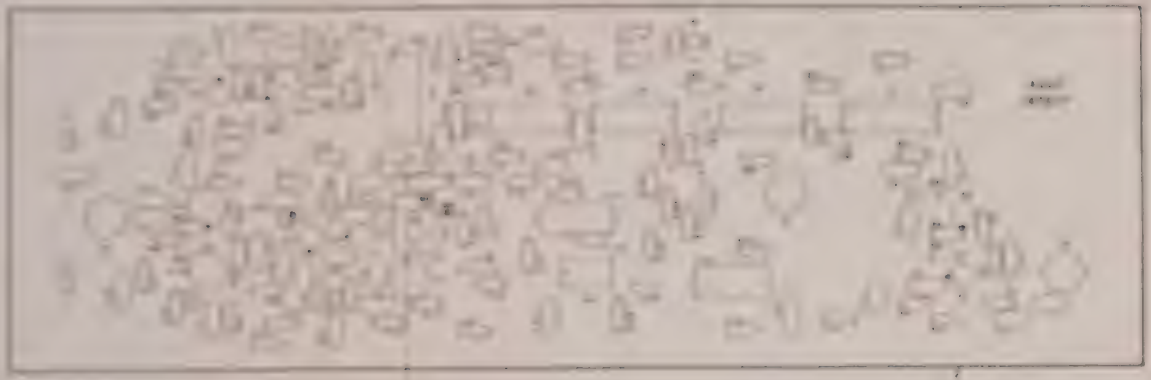

R14
C5
C6
C7
U4
U5
U6
U7
U8
C13
R7
R9
R6
U9
C19
C17
C18
C12
U10
R16
R5
C16
CR1
R8
U11
U12
U13
U14
U15
C14
C15
R3
R4
C1
C4
R1
R2
C3
CR4
C20
R11
R10
CR2
C8
C21
C22
C13
R13
R12





--PLACES





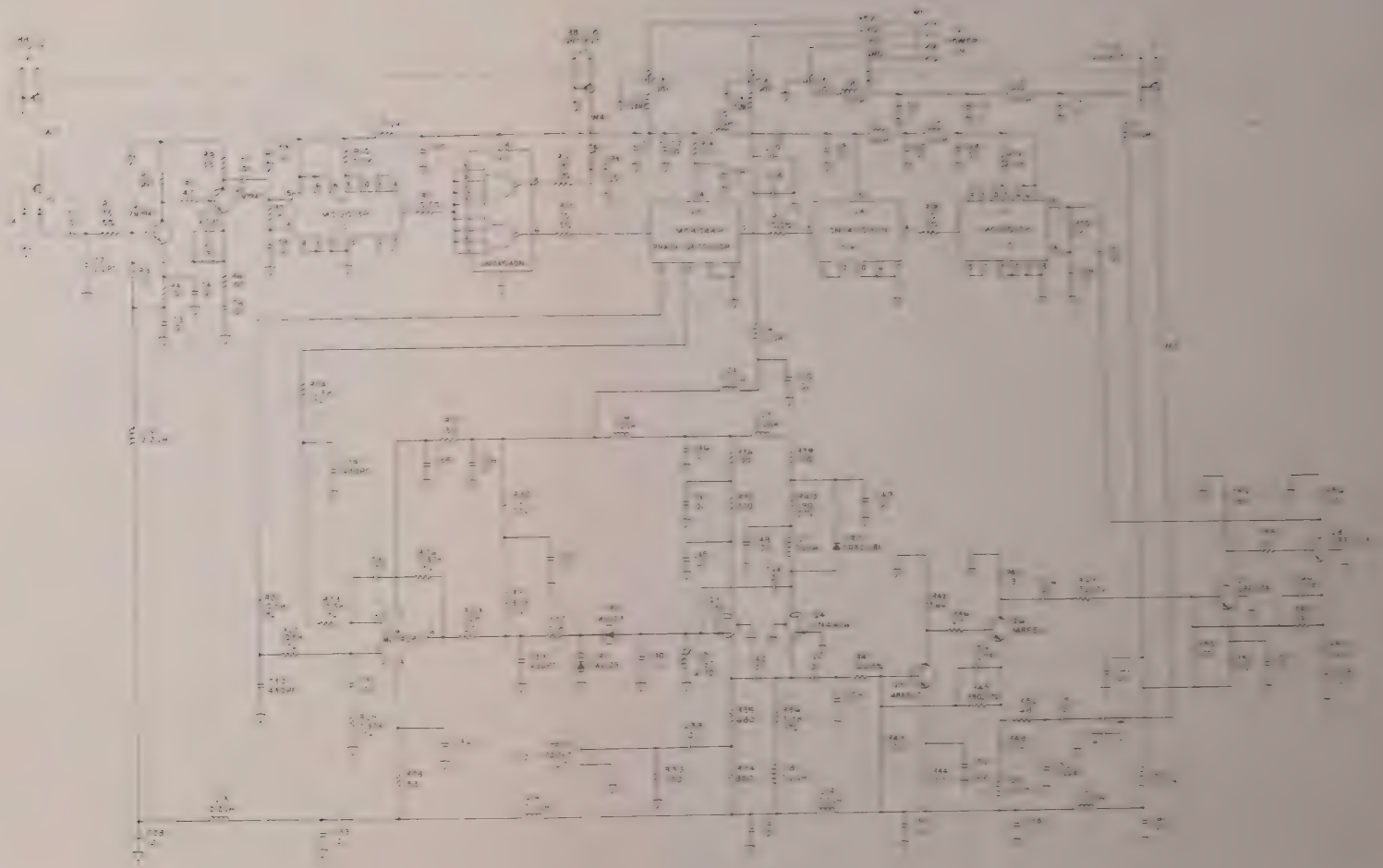
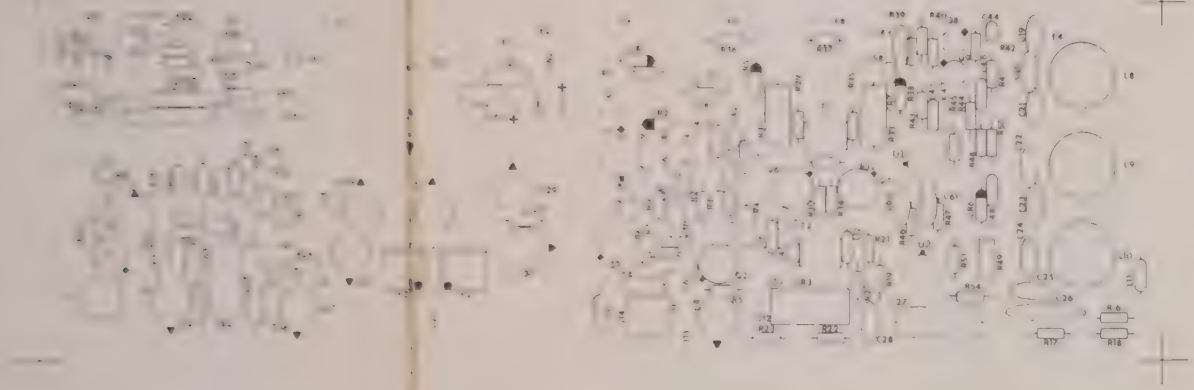


Figure 7-30. IF Local Oscillator Module



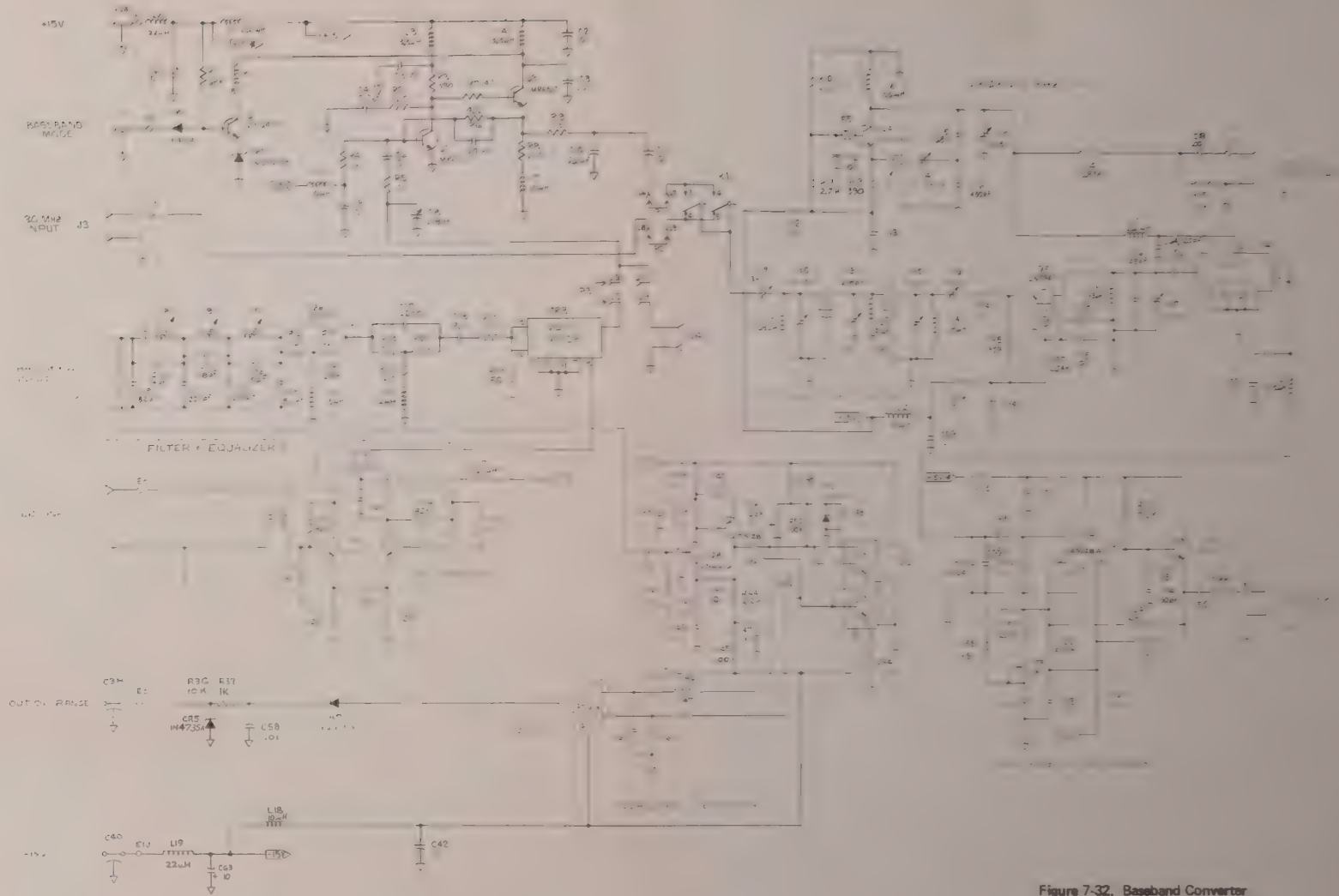
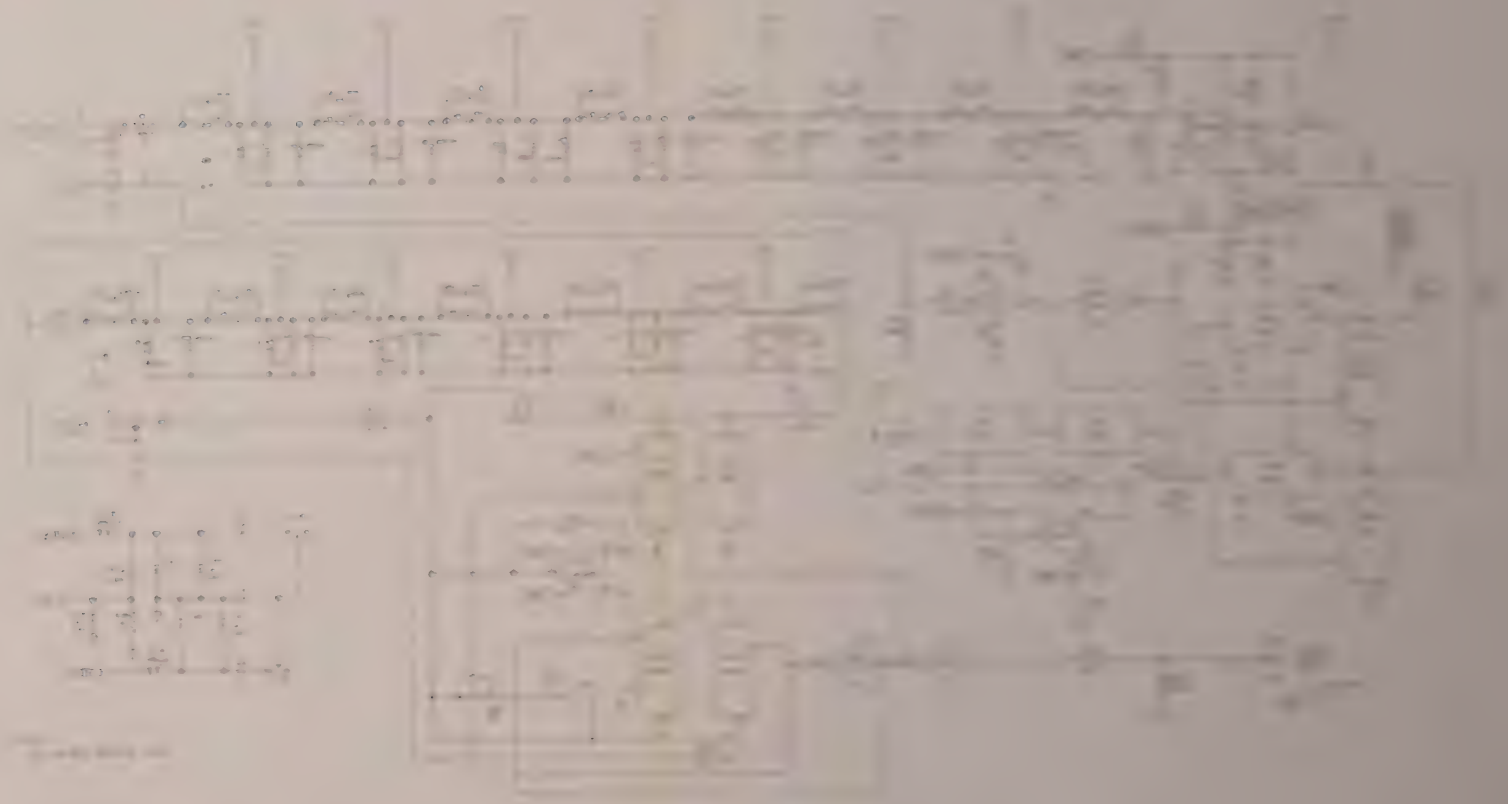
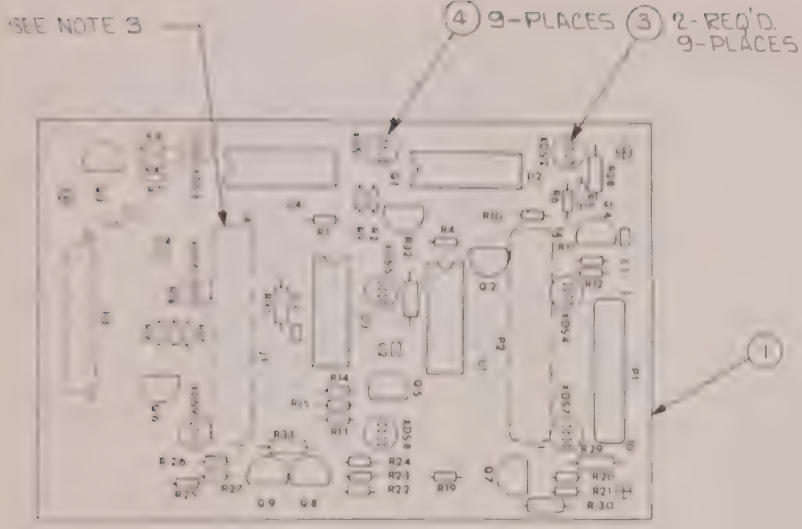



Figure 7-32. Baseband Converter




SEE NOTE 3
4 9-PLACES
3 2-REQ'D. 9-PLACES
1
R1
R4
R10
Q2
R12
R14
R11
Q5
R33
R26
R27
Q9
Q8
R24
R23
R22
R19
Q7
R29
R28
R21
R30
P1
P2

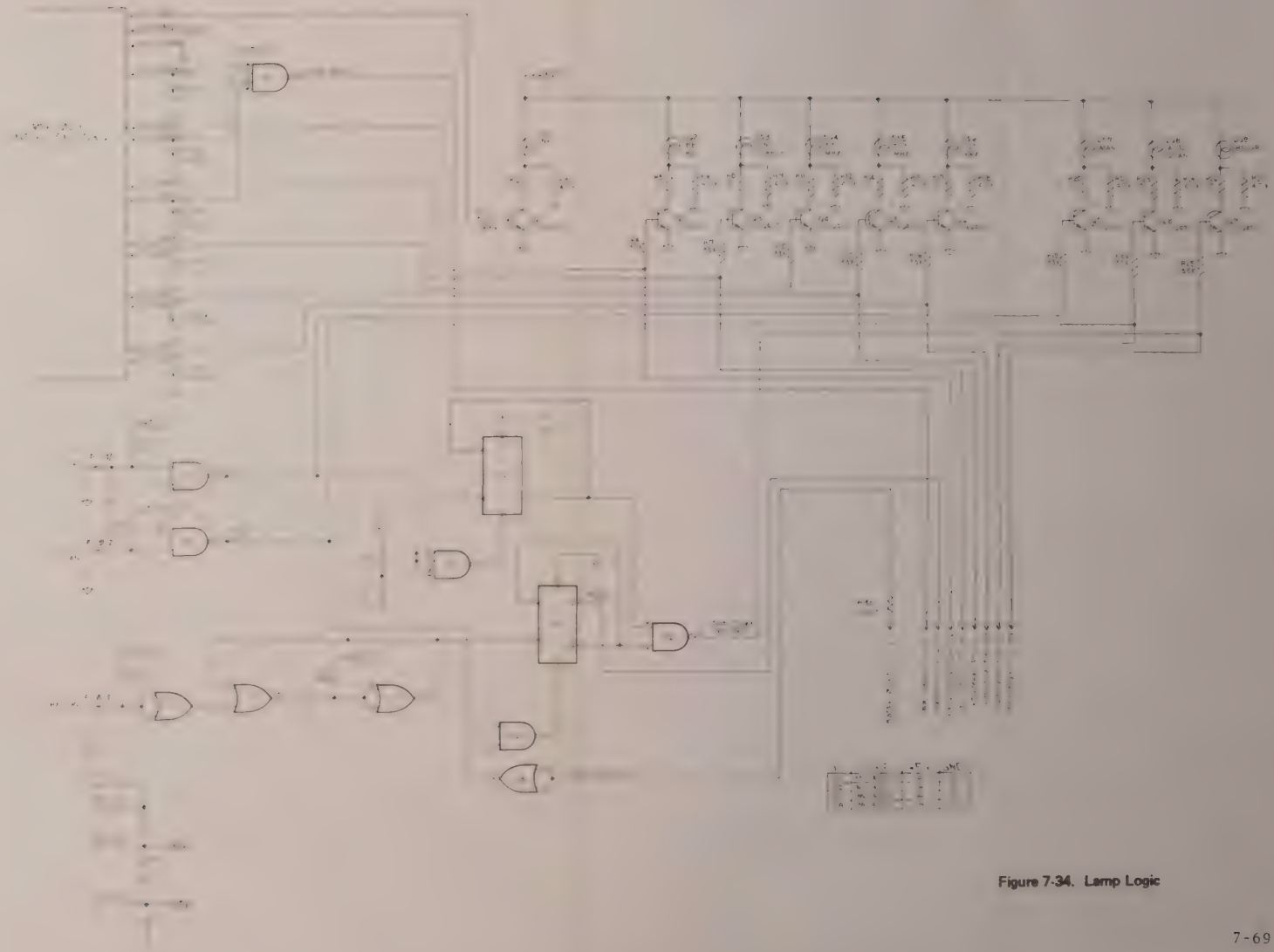
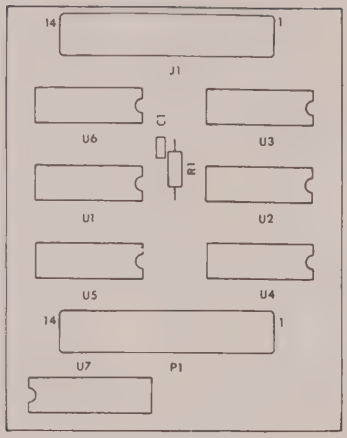


Figure 7-34. Lamp Logic


14
1
J1
U6
C1
U3
R1
U1
U2
U5
U4
14
1
U7
P1

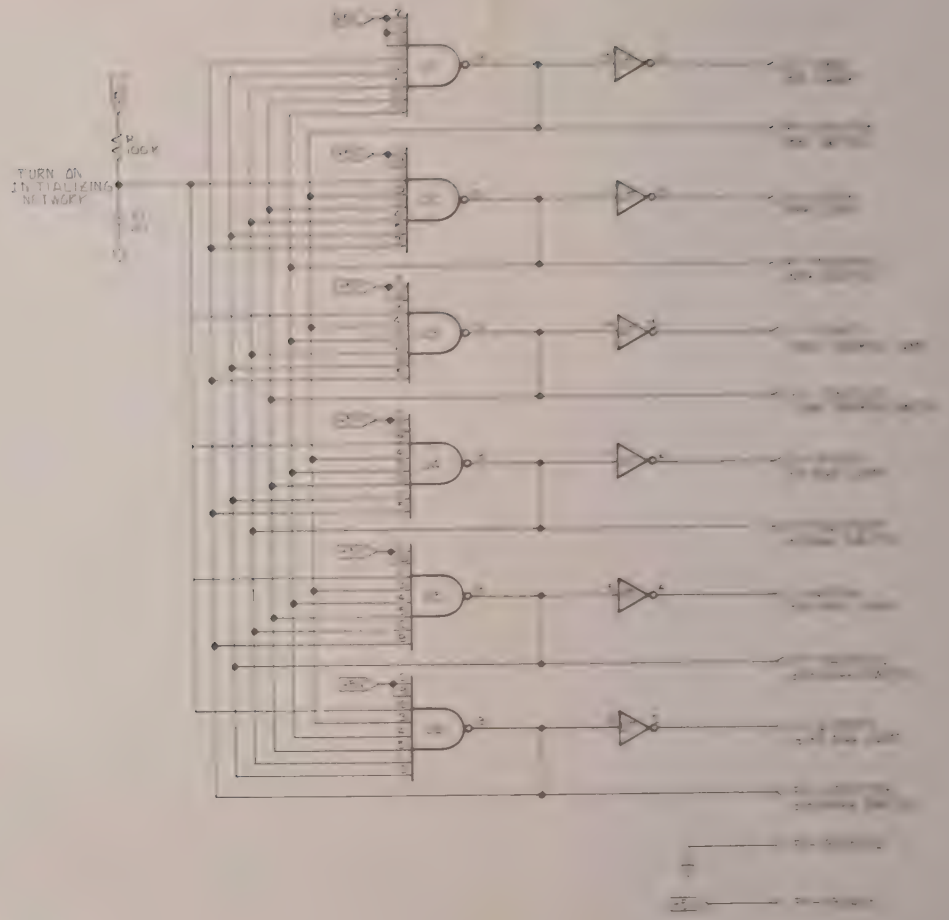
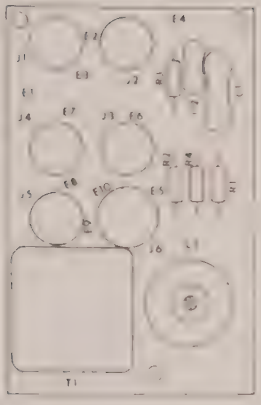



Figure 7.35 Interlock Logic


E4
J1
E3
E2
J2
E7
J4
J3
E6
E8
J5
E10
E5
J6
T1

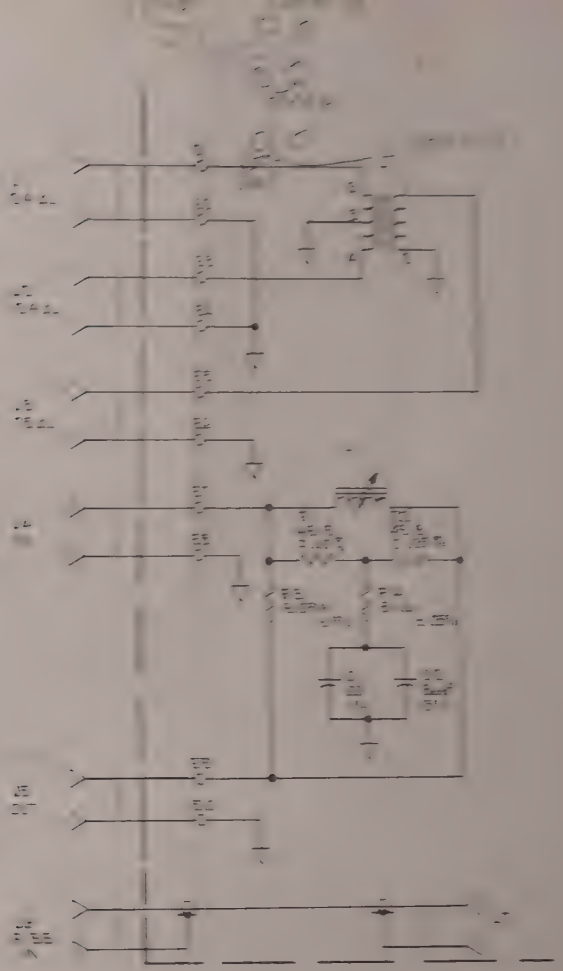
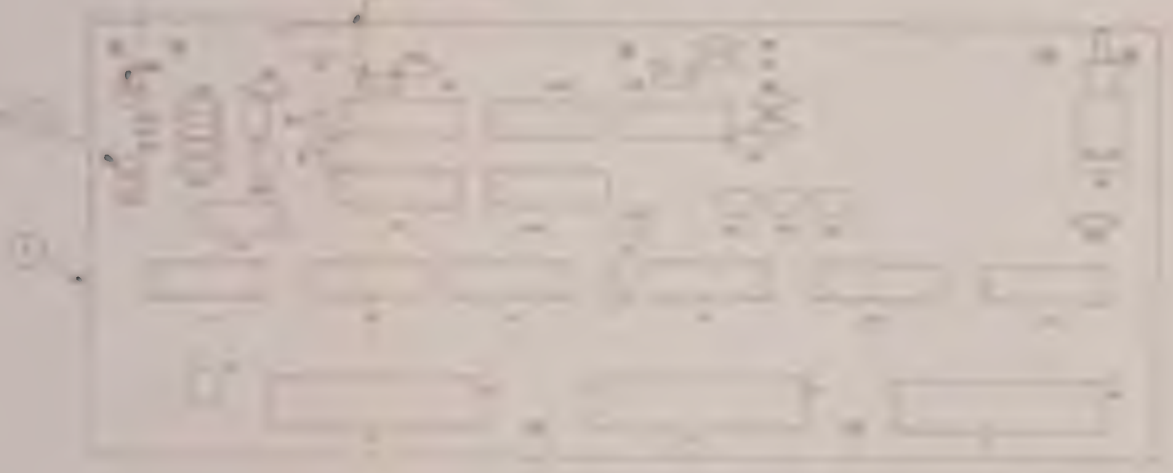
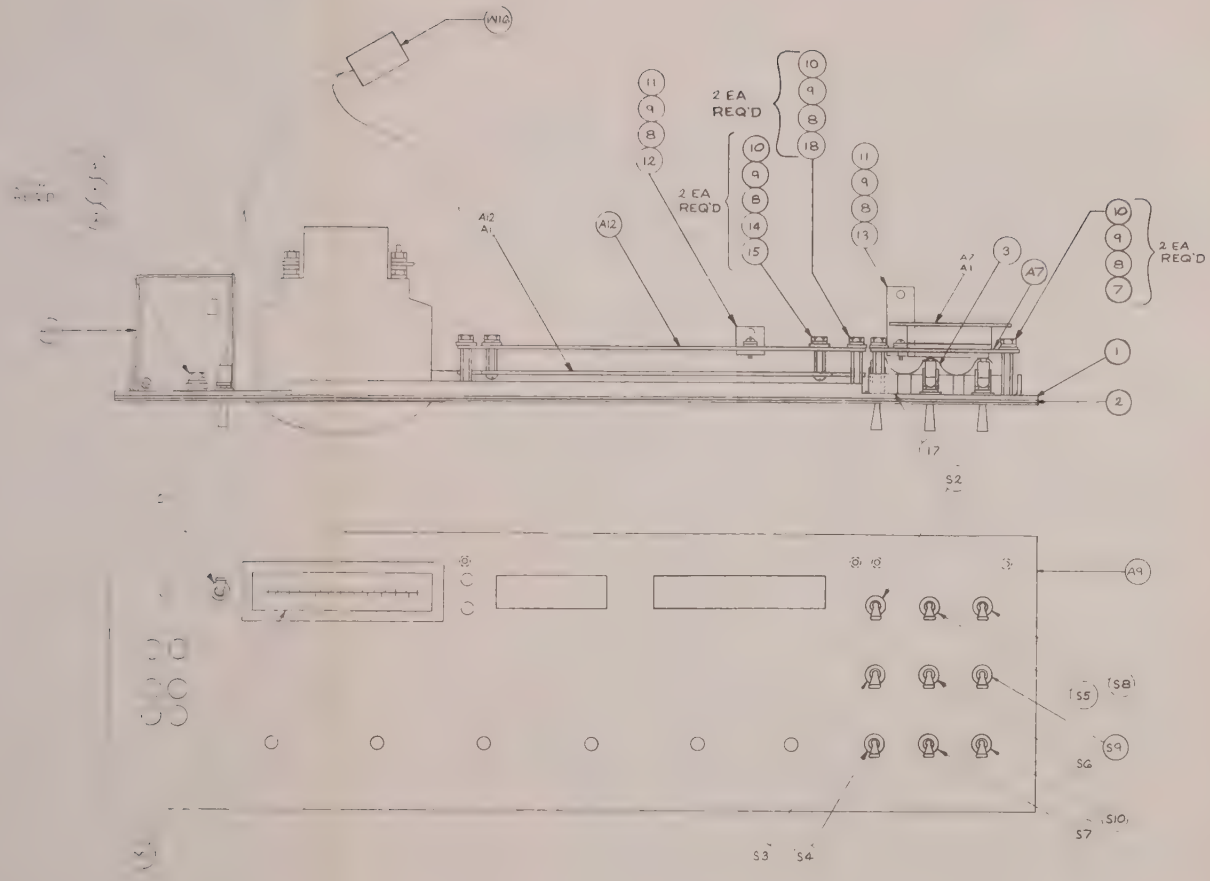
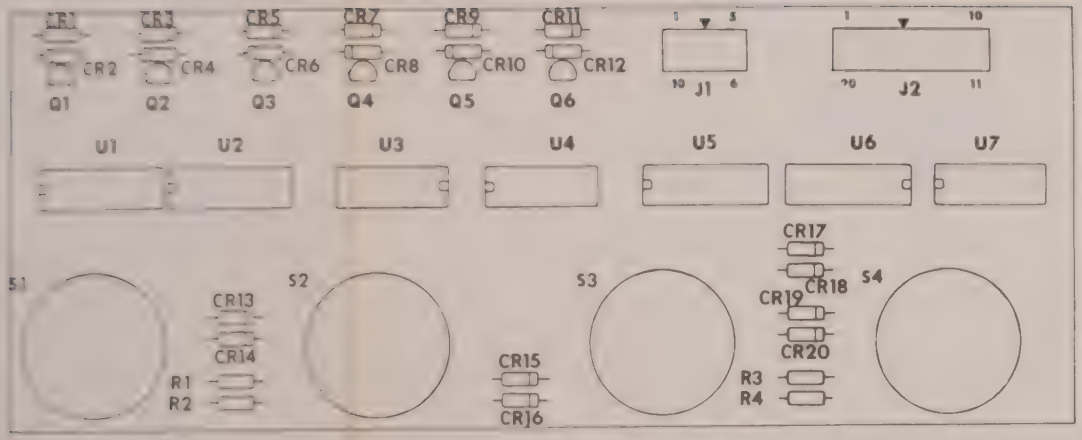


Figure 7-36. De-Emphasis Network



DIGITAL DISPLAY
A12A1
DIGITAL INTERFACE
A12


W10
11
9
8
12
2 EA REQ'D
10
9
8
18
10
9
8
14
15
11
9
8
13
A12 A1
A12
A7 A1
3
A7
10
9
8
7
2 EA REQ'D
1
2
17
S2
A9
S5
S8
S6
S9
S7
S10
S3
S4


CR1
CR3
CR5
CR7
CR9
CR11
CR2
CR4
CR6
CR8
CR10
CR12
Q1
Q2
Q3
Q4
Q5
Q6
J1
J2
U1
U2
U3
U4
U5
U6
U7
S1
S2
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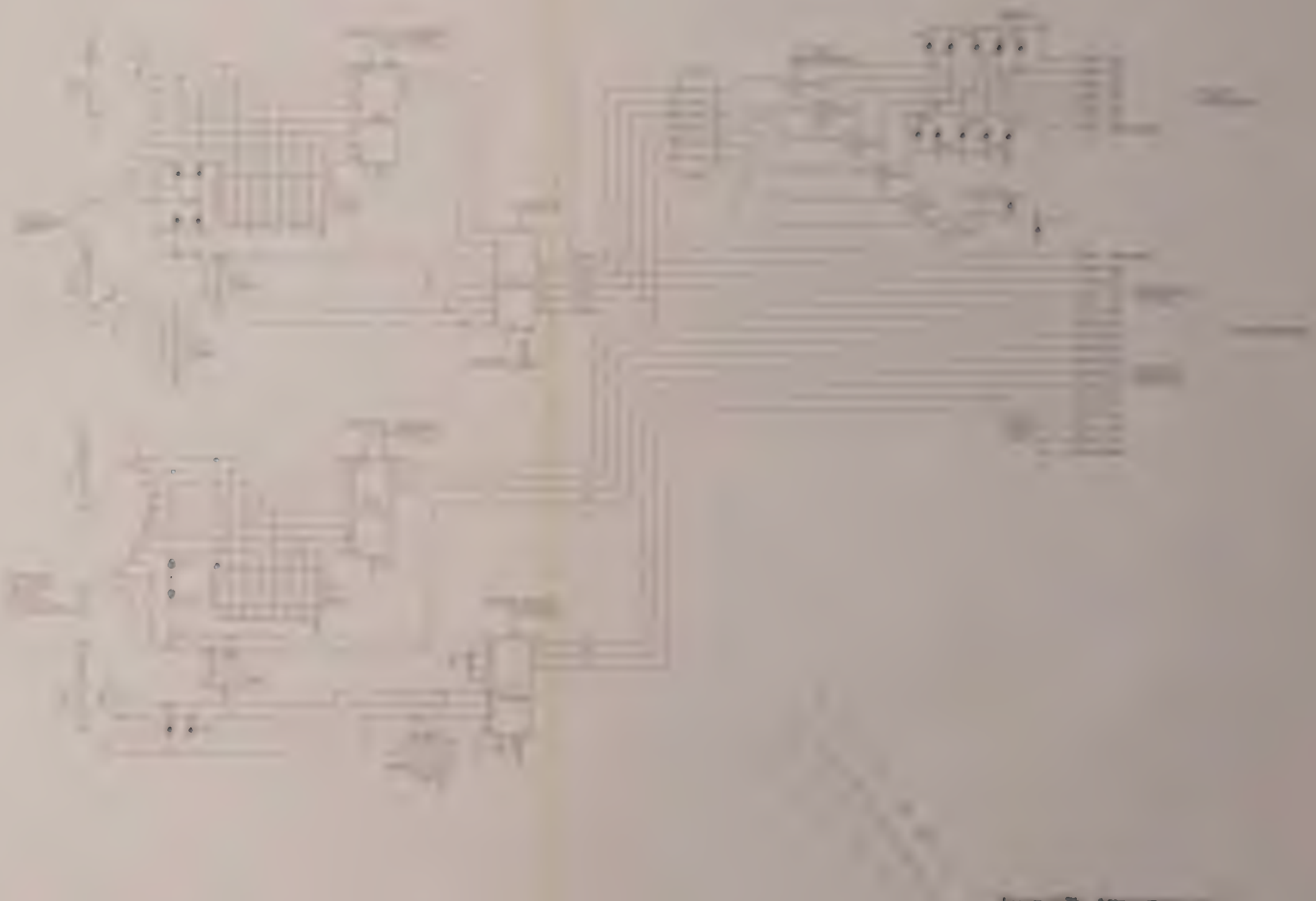
CR19
CR20
R3
R4



# CONVERSION OF VOLTAGE AND POWER RATIOS TO DECIBELS

The basic chart below indicates the number of decibels (dB) corresponding to the listed ratios of voltage or power over the range of −20 to +20 dB. For voltage or power ratios greater than those included in the chart, the ratio can be broken down into a product of two numbers, the value in dB for each found separately, and the two results added. Example: To convert a power ratio of 2,000:1 to dB, express 2,000 as $2 \times 10^3$; the number of dB corresponding to a power ratio of 2 is very nearly 3, and the number of dB for a power ratio of $10^3$ is 30. Therefore, the power ratio of 2,000:1 is approximately 30 dB + 3 dB = 33 dB. In the lower righthand corner of the chart dB values for voltage and power ratios of integral powers of 10 are given.

| *Voltage Ratio* | *Power Ratio* | *−dB+* | *Voltage Ratio* | *Power Ratio* | *Voltage Ratio* | *Power Ratio* | *−dB+* | *Voltage Ratio* | *Power Ratio* | *Voltage Ratio* | *Power Ratio* | *−dB+* | *Voltage Ratio* | *Power Ratio* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.000** | **1.000** | **0** | **1.000** | **1.000** | **.447** | **.200** | **7.0** | **2.239** | **5.012** | **.200** | **.0398** | **14.0** | **5.012** | **25.12** |
| .989 | .977 | .1 | 1.012 | 1.023 | .442 | .195 | 7.1 | 2.265 | 5.129 | .197 | .0389 | 14.1 | 5.070 | 25.70 |
| .977 | .955 | .2 | 1.023 | 1.047 | .437 | .191 | 7.2 | 2.291 | 5.248 | .195 | .0380 | 14.2 | 5.129 | 26.30 |
| .966 | .933 | .3 | 1.035 | 1.072 | .432 | .186 | 7.3 | 2.317 | 5.370 | .193 | .0372 | 14.3 | 5.188 | 26.92 |
| .955 | .912 | .4 | 1.047 | 1.096 | .427 | .182 | 7.4 | 2.344 | 5.495 | .191 | .0363 | 14.4 | 5.248 | 27.54 |
| .944 | .891 | .5 | 1.059 | 1.122 | .422 | .178 | 7.5 | 2.371 | 5.623 | .188 | .0355 | 14.5 | 5.309 | 28.18 |
| .933 | .871 | .6 | 1.072 | 1.148 | .417 | .174 | 7.6 | 2.399 | 5.754 | .186 | .0347 | 14.6 | 5.370 | 28.84 |
| .923 | .851 | .7 | 1.084 | 1.175 | .412 | .170 | 7.7 | 2.427 | 5.888 | .184 | .0339 | 14.7 | 5.433 | 29.51 |
| .912 | .832 | .8 | 1.096 | 1.202 | .407 | .166 | 7.8 | 2.455 | 6.026 | .182 | .0331 | 14.8 | 5.495 | 30.20 |
| .902 | .813 | .9 | 1.109 | 1.230 | .403 | .162 | 7.9 | 2.483 | 6.166 | .180 | .0324 | 14.9 | 5.559 | 30.90 |
| **.891** | **.794** | **1.0** | **1.122** | **1.259** | **.398** | **.159** | **8.0** | **2.512** | **6.310** | **.178** | **.0316** | **15.0** | **5.623** | **31.62** |
| .881 | .776 | 1.1 | 1.135 | 1.288 | .394 | .155 | 8.1 | 2.541 | 6.457 | .176 | .0309 | 15.1 | 5.689 | 32.36 |
| .871 | .759 | 1.2 | 1.148 | 1.318 | .389 | .151 | 8.2 | 2.570 | 6.607 | .174 | .0302 | 15.2 | 5.754 | 33.11 |
| .861 | .741 | 1.3 | 1.161 | 1.349 | .385 | .148 | 8.3 | 2.600 | 6.761 | .172 | .0295 | 15.3 | 5.821 | 33.88 |
| .851 | .724 | 1.4 | 1.175 | 1.380 | .380 | .145 | 8.4 | 2.630 | 6.918 | .170 | .0288 | 15.4 | 5.888 | 34.67 |
| .841 | .708 | 1.5 | 1.189 | 1.413 | .376 | .141 | 8.5 | 2.661 | 7.079 | .168 | .0282 | 15.5 | 5.957 | 35.48 |
| .832 | .692 | 1.6 | 1.202 | 1.445 | .372 | .138 | 8.6 | 2.692 | 7.244 | .166 | .0275 | 15.6 | 6.026 | 36.31 |
| .822 | .676 | 1.7 | 1.216 | 1.479 | .367 | .135 | 8.7 | 2.723 | 7.413 | .164 | .0269 | 15.7 | 6.095 | 37.15 |
| .813 | .661 | 1.8 | 1.230 | 1.514 | .363 | .132 | 8.8 | 2.754 | 7.586 | .162 | .0263 | 15.8 | 6.166 | 38.02 |
| .804 | .646 | 1.9 | 1.245 | 1.549 | .359 | .129 | 8.9 | 2.786 | 7.762 | .160 | .0257 | 15.9 | 6.237 | 38.90 |
| **.794** | **.631** | **2.0** | **1.259** | **1.585** | **.355** | **.126** | **9.0** | **2.818** | **7.943** | **.159** | **.0251** | **16.0** | **6.310** | **39.81** |
| .785 | .617 | 2.1 | 1.274 | 1.622 | .351 | .123 | 9.1 | 2.851 | 8.128 | .157 | .0246 | 16.1 | 6.383 | 40.74 |
| .776 | .603 | 2.2 | 1.288 | 1.660 | .347 | .120 | 9.2 | 2.884 | 8.318 | .155 | .0240 | 16.2 | 6.457 | 41.69 |
| .767 | .589 | 2.3 | 1.303 | 1.698 | .343 | .118 | 9.3 | 2.917 | 8.511 | .153 | .0234 | 16.3 | 6.531 | 42.66 |
| .759 | .575 | 2.4 | 1.318 | 1.738 | .339 | .115 | 9.4 | 2.951 | 8.710 | .151 | .0229 | 16.4 | 6.607 | 43.65 |
| .750 | .562 | 2.5 | 1.334 | 1.778 | .335 | .112 | 9.5 | 2.985 | 8.913 | .150 | .0224 | 16.5 | 6.683 | 44.67 |
| .741 | .550 | 2.6 | 1.349 | 1.820 | .331 | .110 | 9.6 | 3.020 | 9.120 | .148 | .0219 | 16.6 | 6.761 | 45.71 |
| .733 | .537 | 2.7 | 1.365 | 1.862 | .327 | .107 | 9.7 | 3.055 | 9.333 | .146 | .0214 | 16.7 | 6.839 | 46.77 |
| .724 | .525 | 2.8 | 1.380 | 1.905 | .324 | .105 | 9.8 | 3.090 | 9.550 | .145 | .0209 | 16.8 | 6.918 | 47.86 |
| .716 | .513 | 2.9 | 1.396 | 1.950 | .320 | .102 | 9.9 | 3.126 | 9.772 | .143 | .0204 | 16.9 | 6.998 | 48.98 |
| **.708** | **.501** | **3.0** | **1.413** | **1.995** | **.316** | **.100** | **10.0** | **3.162** | **10.000** | **.141** | **.0200** | **17.0** | **7.079** | **50.12** |
| .700 | .490 | 3.1 | 1.429 | 2.042 | .313 | .0977 | 10.1 | 3.199 | 10.23 | .140 | .0195 | 17.1 | 7.161 | 51.29 |
| .692 | .479 | 3.2 | 1.445 | 2.089 | .309 | .0955 | 10.2 | 3.236 | 10.47 | .138 | .0191 | 17.2 | 7.244 | 52.48 |
| .684 | .468 | 3.3 | 1.462 | 2.138 | .306 | .0933 | 10.3 | 3.273 | 10.72 | .137 | .0186 | 17.3 | 7.328 | 53.70 |
| .676 | .457 | 3.4 | 1.479 | 2.188 | .302 | .0912 | 10.4 | 3.311 | 10.96 | .135 | .0182 | 17.4 | 7.413 | 54.95 |
| .668 | .447 | 3.5 | 1.496 | 2.239 | .299 | .0891 | 10.5 | 3.350 | 11.22 | .133 | .0178 | 17.5 | 7.499 | 56.23 |
| .661 | .437 | 3.6 | 1.514 | 2.291 | .295 | .0871 | 10.6 | 3.388 | 11.48 | .132 | .0174 | 17.6 | 7.586 | 57.54 |
| .653 | .427 | 3.7 | 1.531 | 2.344 | .292 | .0851 | 10.7 | 3.428 | 11.75 | .130 | .0170 | 17.7 | 7.674 | 58.88 |
| .646 | .417 | 3.8 | 1.549 | 2.399 | .288 | .0832 | 10.8 | 3.467 | 12.02 | .129 | .0166 | 17.8 | 7.762 | 60.26 |
| .638 | .407 | 3.9 | 1.567 | 2.455 | .285 | .0813 | 10.9 | 3.508 | 12.30 | .127 | .0162 | 17.9 | 7.852 | 61.66 |
| **.631** | **.398** | **4.0** | **1.585** | **2.512** | **.282** | **.0794** | **11.0** | **3.548** | **12.59** | **.126** | **.0159** | **18.0** | **7.943** | **63.10** |
| .624 | .389 | 4.1 | 1.603 | 2.570 | .279 | .0776 | 11.1 | 3.589 | 12.88 | .125 | .0155 | 18.1 | 8.035 | 64.57 |
| .617 | .380 | 4.2 | 1.622 | 2.630 | .275 | .0759 | 11.2 | 3.631 | 13.18 | .123 | .0151 | 18.2 | 8.128 | 66.07 |
| .610 | .372 | 4.3 | 1.641 | 2.692 | .272 | .0741 | 11.3 | 3.673 | 13.49 | .122 | .0148 | 18.3 | 8.222 | 67.61 |
| .603 | .363 | 4.4 | 1.660 | 2.754 | .269 | .0724 | 11.4 | 3.715 | 13.80 | .120 | .0145 | 18.4 | 8.318 | 69.18 |
| .596 | .355 | 4.5 | 1.679 | 2.818 | .266 | .0708 | 11.5 | 3.758 | 14.13 | .119 | .0141 | 18.5 | 8.414 | 70.79 |
| .589 | .347 | 4.6 | 1.698 | 2.884 | .263 | .0692 | 11.6 | 3.802 | 14.45 | .118 | .0138 | 18.6 | 8.511 | 72.44 |
| .582 | .339 | 4.7 | 1.718 | 2.951 | .260 | .0676 | 11.7 | 3.846 | 14.79 | .116 | .0135 | 18.7 | 8.610 | 74.13 |
| .575 | .331 | 4.8 | 1.738 | 3.020 | .257 | .0661 | 11.8 | 3.890 | 15.14 | .115 | .0132 | 18.8 | 8.710 | 75.86 |
| .569 | .324 | 4.9 | 1.758 | 3.090 | .254 | .0646 | 11.9 | 3.936 | 15.49 | .114 | .0129 | 18.9 | 8.811 | 77.62 |
| **.562** | **.316** | **5.0** | **1.778** | **3.162** | **.251** | **.0631** | **12.0** | **3.981** | **15.85** | **.112** | **.0126** | **19.0** | **8.913** | **79.43** |
| .556 | .309 | 5.1 | 1.799 | 3.236 | .248 | .0617 | 12.1 | 4.027 | 16.22 | .111 | .0123 | 19.1 | 9.016 | 81.28 |
| .550 | .302 | 5.2 | 1.820 | 3.311 | .246 | .0603 | 12.2 | 4.074 | 16.60 | .110 | .0120 | 19.2 | 9.120 | 83.18 |
| .543 | .295 | 5.3 | 1.841 | 3.388 | .243 | .0589 | 12.3 | 4.121 | 16.98 | .108 | .0118 | 19.3 | 9.226 | 85.11 |
| .537 | .288 | 5.4 | 1.862 | 3.467 | .240 | .0575 | 12.4 | 4.169 | 17.38 | .107 | .0115 | 19.4 | 9.333 | 87.10 |
| .531 | .282 | 5.5 | 1.884 | 3.548 | .237 | .0562 | 12.5 | 4.217 | 17.78 | .106 | .0112 | 19.5 | 9.441 | 89.13 |
| .525 | .275 | 5.6 | 1.905 | 3.631 | .234 | .0550 | 12.6 | 4.266 | 18.20 | .105 | .0110 | 19.6 | 9.550 | 91.20 |
| .519 | .269 | 5.7 | 1.928 | 3.715 | .232 | .0537 | 12.7 | 4.315 | 18.62 | .104 | .0107 | 19.7 | 9.661 | 93.33 |
| .513 | .263 | 5.8 | 1.950 | 3.802 | .229 | .0525 | 12.8 | 4.365 | 19.05 | .102 | .0105 | 19.8 | 9.772 | 95.50 |
| .507 | .257 | 5.9 | 1.972 | 3.890 | .227 | .0513 | 12.9 | 4.416 | 19.50 | .101 | .0102 | 19.9 | 9.886 | 97.72 |
| **.501** | **.251** | **6.0** | **1.995** | **3.981** | **.224** | **.0501** | **13.0** | **4.467** | **19.95** | **.100** | **.0100** | **20.0** | **10.000** | **100.00** |
| .496 | .246 | 6.1 | 2.018 | 4.074 | .221 | .0490 | 13.1 | 4.519 | 20.42 | | $10^{-3}$ | 30 | | $10^3$ |
| .490 | .240 | 6.2 | 2.042 | 4.169 | .219 | .0479 | 13.2 | 4.571 | 20.89 | $10^{-2}$ | $10^{-4}$ | 40 | $10^2$ | $10^4$ |
| .484 | .234 | 6.3 | 2.065 | 4.266 | .216 | .0468 | 13.3 | 4.624 | 21.38 | | | | | |
| .479 | .229 | 6.4 | 2.089 | 4.365 | .214 | .0457 | 13.4 | 4.677 | 21.88 | | $10^{-5}$ | 50 | | $10^5$ |
| .473 | .224 | 6.5 | 2.113 | 4.467 | .211 | .0447 | 13.5 | 4.732 | 22.39 | $10^{-3}$ | $10^{-6}$ | 60 | $10^3$ | $10^6$ |
| .468 | .219 | 6.6 | 2.138 | 4.571 | .209 | .0437 | 13.6 | 4.786 | 22.91 | | $10^{-7}$ | 70 | | $10^7$ |
| .462 | .214 | 6.7 | 2.163 | 4.677 | .207 | .0427 | 13.7 | 4.842 | 23.44 | $10^{-4}$ | $10^{-8}$ | 80 | $10^4$ | $10^8$ |
| .457 | .209 | 6.8 | 2.188 | 4.786 | .204 | .0417 | 13.8 | 4.898 | 23.99 | | $10^{-9}$ | 90 | | $10^9$ |
| .452 | .204 | 6.9 | 2.213 | 4.898 | .202 | .0407 | 13.9 | 4.955 | 24.55 | | | | | |
| | | | | | | | | | | $10^{-5}$ | $10^{-10}$ | 100 | $10^5$ | $10^{10}$ |
| | | | | | | | | | | | $10^{-11}$ | 110 | | $10^{11}$ |
| | | | | | | | | | | $10^{-6}$ | $10^{-12}$ | 120 | $10^6$ | $10^{12}$ |

**Scientific-Atlanta, Inc.** 3845 Pleasantdale Rd., Atlanta, Ga. 30340, Tel. 404-449-2000, TWX 810-766-4912, Telex 054-2898, Cable SCIATLADORA

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